AMERICAN CINEMATOGRAPHER

The Motion Picture CAMERA Magazine

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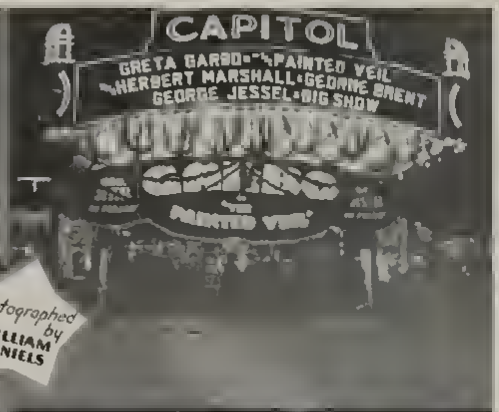

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AMERICAN CINEMATOGRAPHER

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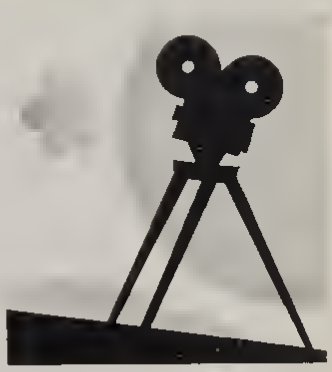

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- Something about makeup, especially as it relates to the cinematographer and the relation between the cinematographer and the makeup man, how they can cooperate to secure better results
- James L Fritz will interview one or two more of our famous ace cinematographers He will give you the critic's slant of the man behind the camera
- We are promised an article telling us how the pictures of the Hauptmann trial were secured without the trooper who stood alongside of the camera knowing it was running It sounds interesting

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THE AMERICAN SOCIETY OF CINEMATOGRAPHERS was founded in 1918 for the purpose of bringing into closer confederation and cooperation all those leaders in the cinematographic art and science whose aim is and ever will be to strive for pre-eminence in artistic perfection and technical mastery of this art and science Its purpose is to further the artistic and scientific advancement of the cinema and its allied crafts through unceasing research and experimentation as well as through bringing the artists and the scientists of cinematography into more intimate fellowship To this end its membership is composed of the outstanding cinematographers of the world with Associate and Honorary memberships bestowed upon those who, though not active cinematographers, are engaged none the less in kindred pursuits, and who have, by their achievements, contributed outstandingly to the progress of cinematography as an Art or as a Science To further these lofty aims and to fittingly chronicle the progress of cinematography, the Society's publication, The American Cinematographer, is dedicated

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High Intensity Mercury Vapor Lamp for Photographic Applications

by
R. E. Farnham
With General Electric Co

Color	Wave Length (Angstroms)	Per cent*	
Ultra-violet	3654	2 7	32 0%
Violet	4047	8 1	
	4358	20 3	
Blue	4950	9	
Green	5461	29 7	
Yellow	5780	20 0	
Orange	6234	1 4	
Red	6716	2 1	
	7130	2 6	
Infra Red	7660	3 2	

*Data by Dr Barnes—Lamp Dev Lab

THE announcement of the new high intensity mercury vapor lamp was soon followed by a considerable number of inquiries as to its merit for the various phases of photographic work These are based on the more or less general knowledge that practically all photo-sensitive materials function more readily in the blue-violet part of the spectrum and that therefore an illuminant having a large part of its energy output in this region may have many important applications It is, of course, obvious that there is no point in applying the mercury vapor lamp for the various photographic applications unless it can show some definite advantage This can be a reduction in the wattage necessary to do a particular job, or, what is more important, shorter exposures with the same wattage which means greater economy or greater production Accordingly, the Nela Park Engineering Department has made a preliminary investigation of the new source with the various requirements of the photographic field in mind

The high intensity mercury vapor lamp is available at the present time in the 400-watt (14000-lumens) size only (Actually, with its regulator, each unit draws 420 to 475 watts) Its three competitors are (1) the white flame and solid carbon arcs, (2) the older type mercury vapor tube, and (3) the MAZDA lamp, particularly the photoflood type

The arcs consume from 1200 to 4500 watts (line) which means that from three to ten mercury lamps complete with control equipments would be necessary to replace a single arc lamp on a comparable wattage basis Similarly, the No 4 Photoflood (1000-watts, 33000-lumens) and the Movieflood (2000-watts, 66000-lumens) would require the employment of 2 to 3 and 5 mercury outfits respectively to replace a single MAZDA lamp, with the result that the mercury vapor lamp starts with somewhat of a handicap, being in such relatively small wattage units The introduction of the mercury vapor lamp to many of the photographic applications would be greatly facilitated were the lamp available in larger units

The spectrum of the high intensity mercury lamp is of the discontinuous type, that is, the light is given off only at certain wave lengths and is totally missing at others This is quite different from that of the MAZDA lamp which is continuous through all visible wave lengths The spectral energy distribution of the high intensity mercury lamp as it is now being supplied is shown by the above table

It is the energy in the near-ultra-violet, violet and blue regions of the spectrum, amounting to about 32% of the total radiation in the visible or near-visible spectrum that is of greatest interest in connection with the use of this lamp with photo-sensitive materials In this same range, namely, 3654 to 5000 Angstroms the Photoflood Lamps emit approximately 22% of their energy Thus, from the light quality standpoint the mercury vapor lamp should be considerably over 50% more effective than the Photofloods for the same wattage, especially with those materials which show rapidly increasing sensitivity towards the extreme violet

There are three characteristics of this lamp, different from other sources which must be considered in its practical application in photographic work (1) Limited burning position, i e , the lamp must be operated vertically, base up (2) The lamp requires approximately 15 minutes "warming up" before reaching full brilliancy and if it is turned off even for an instant it will not relight until it has cooled to practically room temperature (3) Its operation is limited to alternating current circuits

The following paragraphs briefly discuss the application of the high intensity mercury vapor source to still photography

Commercial Photography

Under this subhead comes the photography of a larger variety of objects, and in many instances, the ability to differentiate colors is most important Panchromatic film is universally employed. The mercury lamp would hardly be applicable both from its deficiency of some colors and its slow starting. Photographers usually like to get set up, make their picture, and develop the negative in as short a time as possible, then sometimes go back and make another negative if the first is not satisfactory The slow start as well as the inability to relight the lamp immediately, might prove a handicap for many photographers without compensating advantages

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George Folsey at extreme left directing photography in the M G M production "Reckless" starring Jean Harlow

Artistic Honesty in Cinematography

by
George J. Folsey, A.S.C.

BEFORE a person can express a thing convincingly, he must be convinced of it himself He must understand it he must have had in his own past experience something in same measure comparable to that which he wishes to express In all lines of artistic endeavor, this fact is recognized Even in our own industry, writers, directors and actors agree that the most convincing effects are those based to some extent upon the personal experience of the individual artist

To my mind, this is the keynote of truly successful Cinematography It may be argued, of course, that the Cinematographer's task is more mechanical than artistic a merely photographic reproduction of what others place before his lens To a certain extent, of course, this is true, but in actual practice there is far too much variation in the manner in which different Cinematographers would present the same scene to permit us to ignore the fact that despite all commercial considerations and the collectivized nature of film-production, individual expression plays a vital part in camerawork

Therefore, even though others as well, or even better qualified to speak, may hold contrary opinions, I am certain that our work can be entirely convincing only when we base it upon personal experience—memories of things comparable with the scenes we are seeking to put upon the screen To illustrate this more clearly in a picture I once photographed there was a sequence laid in a theatre-manager's office, back-stage in a great playhouse At the rear of the set was a large window through which could be seen the stage, upon which was taking place a rehearsal for a revue The effect should have been strikingly unusual—but it wasn't I have been in many a theatre-manager's office, but nowhere in my past experience could I call upon anything even approximating this particular setting As a result, I was unable to convince myself of the reality of that scene—and accordingly, it was not convincing on the screen, though we spent days making and re-making it

I know that I exerted all possible care in lighting and photographing that scene I used the same methods that I would use for any other shot, and I am morally certain that the calculations and technique of the special-process experts who put in the backstage background were mathematically correct None the less, the scene did not ring true on the screen The only reason I can find to account for this failure is that the scene was not right to begin

(Continued on Page 104)

The Camera's Omniscient Eye

by
A. Lindsley Lane, A.S.C.

WHETHER a sequence, in its conception and execution, is to be shot in scenes all from a normal stage-audience viewpoint, or, the majority of scenes shot objectively, with a few dynamic punches from subjective angles, or only a few orienting shots made normally, and the greater part of the sequence made from interpretive set-ups, or in any other manner, is a question of specific technique the director and cinematographer together must decide, their method dependent on the relative normality or extraordinary quality of the sequence in question. That is, the interrelated cinematic factors of literary content, action, tempo, mood, characters and settings, and audience reaction, must all be considered to ascertain the optimum point for the camera lens (and also its focal-length) at any given moment. Furthermore, as a complementary phase of this creative work, there is always the omniscience of the camera eye to reckon with —that unique illusion of "all-seeingness" which places the motion picture apart from every other form of artistic expression.

"All-seeingness" here means that the camera stimulates, through correct choice of subject-matter and set-up, the sense within the percipient of "being at the most vital part of the experience—at the most advantageous point of perception" throughout the picture.

The omniscience of the camera eye is a function and an ideal which is felt subconsciously by the percipient, rather than understood by him; and picturegoers more or less resent abuse or loss of that function. From this may be inferred why many mystery pictures have been unsatisfactory, the observer sensing the camera might easily have discovered what is withheld too arbitrarily, feels an antagonism toward the picture. At best, the impression carried away from the theatre by the audience is "much ado about little." It is this frustration of the camera's omniscience (instead of the use of that function to complicate) which brings the picturegoer to a semi-awareness of poor story-telling.

The principle can be stated another way. The percipient of an excellently constructed photoplay automatically merges his identity or self with the picture stimuli. On the other hand, in a badly made picture, he fails to realize his identity with the picture and remains simply an unsympathetic, critical observer looking on from the outside.

"Saying the one right thing at the one right time" (omniscient perception) would seem to be **the** basic law of the motion picture. And within this law persists the greatest reason for key-workers cooperating in extended planning and minute preparations before shooting.

One of the finest examples to date of sustained and unitary camera omniscience is to be found in "Crime Without Passion." In harmony with this achievement of the camera's fluent participating in dramatic intent, there is a tenacious rhythm of cumulative suspense and inevitable consummation. The observer of this picture truly becomes its percipient, because of an unusually close integration of creative artistry and technical skill molding into **one** the picture's material, form and subject-matter. And its percipients have conclusive proof of their "experience" in the echoes which roll back over them for days after seeing this picture. In fact, many will discover this particular picture-experience so "strangely new" as to tell others of the "distinctly different picture." And this, not because of, but in spite of the almost total lack of conventional "heart interest" in the story. Incidentally, it is interesting to note that Lee Garmes, one of the industry's leading cinematographers was, in the making of "Crime Without Passion," not only Director of Photography, but also closely cooperating with the Author-Director-Producers as Associate Director.

For the reason that genuine art conceals its own formulation, it may be said that a motion picture which in its showing gives self-evidence of its making is not a good picture artistically and holds the chemistry of dissolution within its own structure, drawing the audience's attention away from its story-experience purpose, is, in other words, destructive to intactness of the "illusion of occurrence" which illusion is the psychological key to a successful motion picture-percipient experience.

Omniscient perception actually achieved in the motion picture results in the percipient having no least feeling or consciousness of the camera's interpretive instrumentality. The cinematographer's work and the use of his tools are self-effaced from the final effect.

Generally speaking, cinematographic effects have in the past been over-stressed rather than repressed. The confusing use of subjective or grotesque angles, stark lighting and over-correcting spectrum filters, the restless mobile

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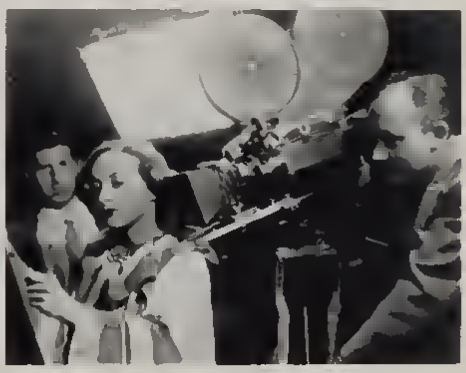

Ernest Haller, A.S.C.

Haller Places Stress on Detail

by
James L. Fritz
Formerly dramatic editor of St. Louis Post Dispatch and New York Daily Mirror

AFTER seeing any one of Ernie Haller's cinematographic products, one can readily realize why this young man is sometimes called the "King of "Detail

Haller has regulated his life so that every hour of the day is spent in a detailed and beneficial manner. Naturally if his life is governed in this way you would expect the same quality in his pictures. This quality makes itself vitally manifest in his latest Warner Bros. production, 'Wonderlust." When viewing this picture one even feels that perhaps some of the artistic quality of the production might have been sacrificed in the endeavor to bring out every underlying movement of the story.

Haller will tell you that once a script is given to him, he will treat it as if it were a text book. It does not receive a mere reading, but he gives it a thorough fine-combing and minute study. This is done so that when he begins the actual work on the picture, the story will be so vividly stamped into his mind that every situation and location will be as familiar to him as his own face. This rigid task which he sets for himself before every picture, enables him to visualize even further than his finished product. He obtains the imaginary reaction of the audience for his work. And he further insists that the product which is turned out of his camera be a thing of pleasure and entertainment even if his audience be made up of critical cinematographers.

In this treatment of the story, he first considers the characters in the story. If they are Aline MacMahon and Guy Kibbee, who portray the principal roles in his most recent effort, he immediately makes a study of their characters from every possible standpoint that his lens will be required to register. Mentally he sets his lights in the various sequences. If the scene is to be a press room of a country newspaper he recalls, if possible, a visit he made at one time or another to this kind of a print shop. He definitely places, for instance, Guy Kibbee at the keyboard of a linotype machine or at the handle of an early-type flat-bed handpress. He sees him as he would look with his face covered with printer's ink. He knows long before his story commences, the amount of light that is going to be necessary to impress on his film the character that this actor is attempting to live.

Haller entered the motion picture business from a draughtsman's board in an architect's office and it is this training which gives him an eye for perspective. But for a display of temper over a pecuniary matter he might still be putting on plans the ideas of architects. He had obtained some extra work for his employer and had been promised compensation for it. When it wasn't forthcoming he told his employer what he thought of him.

With his hat still in his hand he entered the employees' door of a motion picture laboratory and there began the training which has fitted him for the position he now holds among motion picture photographers.

It was while thus employed that the demand for detail was definitely impregnated. He had observed the careless manner that detail was being watched in the early days of cinematography and resolved that when his opportunity came along this would be of utmost importance.

The ace cinematographer has some very definite ideas about makeup. Unfortunately they do not contribute much praise to the manufacturers of cosmetics. He feels that makeup has a definite place in motion pictures but that too much stress is laid on its importance. There is not very much being done with grease paint that cannot be done with lights.

This is not just a theory with him for he has proven it conclusively. He took a well known motion picture star after her makeup had been completed one morning and removed from one side of her face all of the paint, eyeshadow, etc. His experiment received the hearty approval of the star to such an extent that when he photographed her next picture he did so with just ordinary street makeup.

When reading his script, Haller goes through exactly the same process that the assistant director does in breaking down a script. His script is as full of notations as a script-clerk's.

He consults the art director of his picture and learns exactly what he is going to be given in the way of sets. He finds out from the Property Head just what he is going

Continued on Page 102

Photography Should Interpret Personality and Character

by
Gaetano Gaudio, A. S. C.
As told to James L. Fritz

Gaetano Gaudio A.S.C.

THE one outstanding quality of present day motion pictures, to my belief, is the ability on the part of the cinematographer to inject character and feeling into his art. This is the only quality that can be injected into a story through the art of the cinematographer. The other qualities, such as richness and beauty, cannot be injected into any motion picture, unless that quality is possessed by the story or script, the subjects themselves, and the settings and backgrounds with which they are surrounded.

It has always been my belief, that a cinematographer, if he wishes to become proficient in his art, must be a good actor, a good director, and have literary knowledge, so that he will be enabled to bring out the true characterization of the story which he is photographing.

When I am called to begin work on a picture, I first take the script and study it diligently. It is here that I get the first interpretation of the author's thought. I then place myself in each of the roles or parts. I do this so as to obtain the feel of the story. After I have inwardly enacted each part to myself, the characterization which will be portrayed by the subject becomes intimately familiar.

We all know that the film itself, and the canvas upon which it is projected, are drab and lifeless things at best. Then how, knowing this, can we expect audiences to be entertained and amused, unless we, through lighting, shading, and the use of diffusion, build character in the subject? It has been pointed out at various times, that color treatment aids in bringing out character. Under the present color processes, this is not true, because the color treatments now used in motion pictures are mere optical illusions. Character can never be expressed through any falsity on the part of the cinematographer. By this, we mean creating an illusion of character, where such character originally does not exist. Therefore it is my belief that color for motion pictures shall never be a success until a process, similar to the Lumere plate, has been perfected. Such a process would mean that the true and natural colors of the subject would come out of the camera, the same as they were photographed, without distortion or change, instead of the black and white print of today, which must be colored later by a laboratory process.

True characterization is only obtained in one way. The cinematographer must obtain the full feelings of the subject which he is photographing. By feeling, we do not mean the character that the subject is portraying, but he must also obtain the true character of the subject itself, so that he can capture on film, the natural personality and character of the subject. This adds another qualification to the cinematographer. It means that he must be an excellent judge of personalities.

In the last picture I filmed for Warner Brothers, "Go Into Your Dance," in which Al Jolson was the star, a difficult problem arose with which every cinematographer has had to cope at one time or another. Various cinematographers, on previous pictures, had been lighting Jolson's face in such a way as to erase the wrinkles and lines that are naturally his. The result, when this treatment is given to any subject, is that the face becomes a mask and it is difficult to obtain the emotion then being enacted by the subject. In this picure the process was reversed. The subject was lighted in such a way that these wrinkles, without being allowed to become harsh and destructive to the subject's appearance, were brought out enough to allow the subject to retain his true personality and character.

This means of portraying character is being used on the latest Warner Brothers production, "Oil for the Lamps of China." The characterization of the subjects in this particular motion picture are definite and forceful. It is therefore necessary that the cinematographer, if the audience is to gain the full benefit embodied in the story itself, should, at all times, strive to bring out forcefully the character in the faces of the subjects which he is photographing.

I carry character study even further into the fields of cinematographic research than merely the first study of the script and subject. Every scene which is photographed by the motion picture camera, during the course of the day, I also photograph with a Leica camera, which I have with me at all times. These still pictures are then taken home and developed. This enables me to give more time

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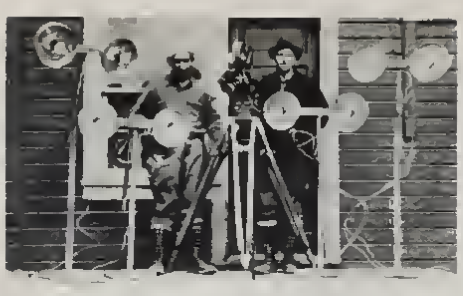


Reflectors made for an emergency from 1000-ft film cans At left Cavaliere at right Beverly Jones, director

Shooting

IN ADDITION to food, camp equipment and other necessary supplies for seven men and four dogs, we had the added problem of a complete Bell and Howell studio outfit, an Akeley, and three Eyemas, not to mention a couple of hundred thousand feet of raw stock and numerous still cameras

On our first trek out from our base camp at False Pass on Unimak Island in the Aleutians, our first serious film problem hit us We needed 400-foot lengths of negative for the Bell and Howell, 200-foot lengths for the Akeley, and 100-foot lengths for the Eyemas Our film had been put up in hermetically sealed containers holding five rolls and designed to withstand the beating they were bound to get in our pack sacks and the dog packs At the start of our first trek, we found the big containers holding the 400-foot Bell and Howell rolls to be too bulky and too large for the dog packs This called for our first technical huddle We finally decided we could use our 200-foot rolls in both the Bell and Howell and Akeley magazines, furthermore they were convenient to carry as were the containers of the 100-foot rolls Luckily we had sufficient negative stock in 200-foot rolls to last us for the season, had we ordered fifty percent of our negative stock to be made up into 400-foot lengths as we had planned previously, it would have caused us no end of trouble and would have been a serious handicap to the photographic success of the adventure This transportation problem was one we, on the camera end, didn't give more than normal attention, yet on an expedition such as this one, it is as vital as knowing what lenses are necessary to have with you for successful camera work

Not very long after our arrival at base camp in the Aleutians, we ran into another problem we had not anticipated We needed some interior shots that were very necessary to the continuity of our adventure story The building in which they were to be made had been altered, and the outside light cut down by the removal of several large windows that had been there in previous years and had allowed plenty of daylight to get into the building We radioed at once to Seattle for Photoflood lamps and reflectors In due course one of the party who had been held up in Seattle by the strike arrived at False Pass with the Photofloods, but no reflectors We needed concentrated light, after another huddle we emerged with the problem licked We happened to have with us some prints of old features that had been given to Father Hubbard by various film companies to show to the Aleut Indians who had never seen a movie before We confiscated a number of 1000-foot film cans from this lot and went to work Ed Levin field manager of the outfit, made eight stands consisting of a wooden base, an upright, and a top arm designed to hold one of the thousand-foot cans at each end The top arm was movable and had holes drilled through it at one-inch intervals, as had the upright This enabled us to raise, lower or tilt the lamps as we desired by merely loosening the bolt that held the top arm to the upright and shifting the whole top arm to whatever combination of holes we needed A couple of flips of the bolt with a wrench and the lamps would remain rigid at any height or angle After the cans were attached to the top arm, the wiring and installation of lamp sockets in the center of the cans was a matter of a few hours We took our juice from a standard A C plant by means of a lead cable to which we had spliced a couple of dozen standard female plugs at convenient intervals One male plug took care of the two lamps on each of these improvised lights The efficiency of these improvised "inkies" was remarkable, they proved to be very flexible and a review later of the shots made with them, showed them to be very satisfactory In fact, I'd wager the average technician would think we had a battery of real lights and a bunch of juicers to run them

Another unlooked for problem grew out of the continual rains, landings in the surf, stream crossings, mud, quicksands and pumice dust in volcanic areas that we encountered during our six months' trek in the most forbidding country you'd ever want to set foot in After a couple of months of exposure to all these, we found our Eyemo tripods, of an approved standard make, to be wilting They couldn't stand the gaff Despite all precautions, rust got the better of the heads and they became loose and the sliding legs filled up with so much mud and pumice dust they finally wouldn't budge On our return to base camp we attempted to repair them, but without necessary replacement parts it was useless Once more, another huddle We always carried with us a sturdy alpenstock—better known as an ice-pick Each member of the party had one They range from three to three and one-half feet long, have a spike on the ground end, and a combination of a mattock blade and a pick blade on the other end They are used for cutting steps in the ice, gaining a hold while climbing, and feeling your way for crevasses and other hidden ground dangers as you trek along We drilled holes in the metal hub of the pick end of the alpenstocks and fitted them with a screw lug of proper diameter to fit the tripod hole of the Eyemos To protect the threads of the lug, the hole in the hub of the ice pick was drilled deep enough to take its entire length when not in use The lug had a screw head and could be raised above the level of the flat-headed pick with a screw driver or more frequently with the hunting knives we always carried The ice pick tripod thus evolved was invaluable to us For com-

The Glaciers in Alaska

by
Nicholas Cavaliere*
Chief Photographer,
Father Bernard Hubbard, S J ,
1934 Alaskan Expedition

***Cavaliere was also first cameraman with Frank Buck having filmed "Wild Cargo" and "Bring 'Em Back Alive" for the noted wild animal hunter.**

era use, we would stick the spike end well into the ground, which would give us a "unipod" as efficient as a tripod You could even get a steady pan shot by grasping the pick and mattock ends and turning the whole pick in the ground slowly and evenly Hand-held Eyemos may be alright, but I've yet to see a rock-steady picture taken in this manner Our ice-pick tripods saved the day so far as the practical use of our Eyemos was concerned, in addition, there were no parts to lose or rust—simple, but effective

Sometimes it's the little things that give you more trouble and can cause more damages than the big ones Our cameras were protected by all-metal carrying cases The cases did their work well for three or four months, then their constant exposure to rain and dampness caused the rivets holding the hinges to rust off the covers, giving the cover a bad fit and allowing mud, wind-driven rain and pumice dust to get inside the cases Only constant vigil and a cleaning of the cameras every morning and night as well as a good oiling, kept them from being damaged seriously by rust On another venture such as this, I'd see to it all camera carrying cases were made of all metal, non-rustable, with equally non-rustable hinge fittings and locks This would have saved a lot of anxiety concerning damage to cameras.

More than once, some of the five-can negative film containers on which the seals had been broken would fill partially with water when we landed our small dories on beaches Dories were the only practical means of landing from our expedition ship "Amelie" on uncharted shores where there was always danger of hidden rocks and reefs close in This caused us considerable anxiety, especially for our exposed film We finally overcame this hazard by taking ordinary canvas dunnage bags and treating them with a waterproofing liquid we had on hand on the ship We placed all our exposed material and open containers in these bags when making dory journeys to and from our expedition ship, and were successful in keeping salt water away from most of our film On another venture such as this I'd be sure to take along a number of waterproofed bags of various sizes designed to hold the various containers of film you take along with you on each leg of the trek Our pack dogs were our most important means of film transportation while on land Everytime we came to a stream, we had to remove the dog packs to keep the open containers from shipping water when the dogs forded the streams Waterproof bags would have eliminated this troublesome procedure, which oftentimes caused us considerable delay in reaching our objectives Continual rain would even reach film stowed in the depths of our own pack sacks Here too, waterproof bags would have relieved considerable anxiety There are plenty of other things to worry about on an expedition into virgin country It is impossible on an expedition of this nature to carry nothing but hermetically sealed containers from camp to camp since it is always necessary to open some of them to obtain film for shooting while en route

Needless to say, a changing bag is a very necessary requirement for reloading We had all sorts of adverse weather to keep out of changing bags, and all sorts of places most of them bad, where it was necessary to reload A waterproof changing bag would have been a gift from Heaven, for in a country where eleven days of straight rain was nothing unusual, it's more than hard to keep a changing bag dry

All in all we covered 8000 miles of water in six months and many on land which included Bogoslof, the famous "disappearing island" of the Bering Sea with its giant sea lions, the hitherto unexplored and unclimbed "Aghileen Pinnacles" on the Alaska Peninsula, the famous "Valley of 10,000 Smokes," with its spectacular steams, the Columbia, Malespina, Hubbard, Mendenhall and Taku glaciers, where giant icebergs are born Lady Luck and precaution brought us home with nearly 100,000 feet of usable material and a great deal more camera-wise as to what we really needed in the line of equipment in addition to what we had thought we needed for expedition camera work, or for that matter, any trip into outdoor country where you're likely to run into similar conditions such as we did

An Eyemo mounted on an "ice-pick" tripod This had to be pressed into use when the dust and rust made our regular tripod unusable

Will Color Help or Hinder?

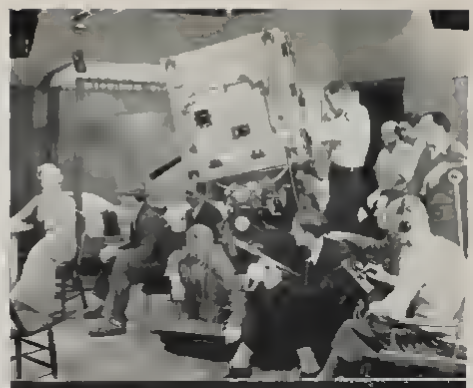
by
William Stull, A.S.C.

THE INTRODUCTION of Technicolor's Three-Color process of natural-color Cinematography, together with the release of "La Cucaracha," has split the film world into two argumentative camps On the one hand are those Cinematographers, Directors, Art-Directors and Executives who are confident that the new process heralds a revolution as sweeping as that brought about by sound In the other camp are those who feel that, although color is interesting, it can play no really important part in the dramatic and artistic advancement of the cinema

Two things only are certain first, that the new process eclipses anything heretofore possible in natural-color cinematography, and second, that it is historically obvious that no previous "color boom" (even the two-color Technicolor boom of 1929-30, which saw 77,000,000 feet of major-studio releases Technicolored) has produced a lasting impression upon our monochrome film world Moreover, the list of all-time box-office champions fails to show a single all-color picture, though several films are included which boasted color sequences This, the colorites retort, proves nothing, for few, if any of the earlier color-films included the elements of outstanding success, but depended chiefly upon color—imperfect color, at that—for their popularity Moreover, say the colorists, the new process is something artistically and esthetically different from its predecessors

If this is true (and there is much evidence to support it), any speculation, based upon previous conceptions of or experience with two-color processes, attempting to forecast the future and potentialities of the new, three-color process, would be ill-founded Therefore, the only logical authorities on the subject are those who are currently using trichrome in actual production Most important of these are, of course, the Producer, the Director, the Art-Director, and the Cinematographer

The Producer of "Becky Sharp," the initial trichrome feature, is John Hay (Jack) Whitney His confidence in color is rather obvious from the fact that he is reputed to have invested $7,000,000 in the formation of Pioneer Pictures, wherewith to pioneer all-color production, as well as having invested heavily in Technicolor, itself As he is not noted for backing unlikely argosies, it is evident that he believes in color



At top Technicolor camera and camera new set Te At top hnicolor camera and camera crew set for a take in the all-color feature 'Becky Sharp" Below Robert Edmond Jones, famous stage designer who designed sets and costumes for "Becky Sharp"

"Becky Sharp's" color designer is Robert Edmond Jones, unquestionably the foremost designer-director of the theatre The term "Art-Director" is actually only a pale description of his activities, for he is in truth far more—a sort of chromatic supervisor of every detail of the production Not only did he design settings and costumes, and plan the coloring of every scene he outlines the chromatic composition of every shot, and serves on the set almost as a co-director and co-cinematographer

Jones is enthusiastic over the possibilities of wisely created color-films "With the new process," he says, "the possibilities are unlimited Rather, they are limited only by the intelligent artistry with which the color is employed And here I must stop to pay tribute to Technicolor's new process it is very nearly perfect, it has nothing in common with any previous process, so far as results are concerned, for it does not distort colors, or give the 'woolly' results we have had heretofore If you give it a color to photograph, it will give you back that same color on the screen, unchanged

"Fully realizing my lack of qualification as a prophet, I am none the less confident that the introduction of this new process is going to bring about a change in screen methods comparable only to that brought about by sound Not as quick, certainly, nor as devastating but once a few really good color films have been released, the Industry will have to become color-conscious

•Continued on Page 106•

PHOTOGRAPHY of the MONTH

"MYSTERY OF EDWIN DROOD" (Universal)

George Robinson, A.S.C.: Directing Cinematographer

Daily Variety (January 17, 1935) "Photography by George Robinson is excellent"

Hollywood Reporter (January 17, 1935) "—and the picture has been exceptionally well photographed"

Motion Picture Daily (January 19, 1935) "The photography of George Robinson is excellent"

"MURDER ON A HONEYMOON" (Radio)

Nick Musuraca, A.S.C.: Directing Cinematographer

Daily Variety (January 21, 1935) "Photography by Nick Musuraca and special effects by Vernon Walker are top notch"

Motion Picture Daily (January 22, 1935) "Nick Musuraca and Vernon Walker are well teamed on photography and effects"

"RHUMBA" (Paramount)

Teddy Tetzlaff, A.S.C.: Directing Cinematographer

Hollywood Reporter (January 23, 1935) "Photography by Teddy Tetzlaff was unusual"

"WHEN A MAN'S A MAN" (Fox)

Frank B. Good, A.S.C.: Directing Cinematographer

Hollywood Reporter (January 25, 1935) "Photography fine"

Daily Variety (January 25, 1935) "—while exteriors by Frank Good provide some very beautiful camera setups"

"VANESSA, HER LOVE STORY" (M-G-M)

Ray June, A.S.C.: Directing Cinematographer

Daily Variety (January 25, 1935) "Photography of Ray June is excellent"

"THE NUT FARM" (Monogram)

Harry Neumann, A.S.C.: Directing Cinematographer

Daily Variety (January 26, 1935) "Photography creditable"

Hollywood Reporter (January 26, 1935) "Photography A-1"

"$20 A WEEK" (Ajax)

Arthur Martinelli, A.S.C.: Directing Cinematographer

Film Daily (January 22, 1935) Photography "Fair"

"SHADOW OF DOUBT" (M-G-M)

Charles Clarke, A.S.C.: Directing Cinematographer

Hollywood Reporter (January 28, 1935) "—and the photography is first rate"

"Charles Clarke's photography is ace high—"

"DEVIL DOGS OF THE AIR" (Warner Bros.)

Arthur Edeson, A.S.C.: Directing Cinematographer

Hollywood Reporter (January 30, 1935) "Photography and mounting are first rate"

Daily Variety (January 30, 1935) "Arthur Edeson's photography is exceptionally good throughout the entire picture"

"AFTER OFFICE HOURS" (M-G-M)

Charles Rosher, A.S.C.: Directing Cinematographer

Daily Variety (January 30, 1935) "Photography is average—"

Hollywood Reporter (January 30, 1935) "—and that Charles Rosher is an ace cameraman—"

"THE GOOD FAIRY" (Universal)

Norbert Brodine, A.S.C.: Directing Cinematographer

Daily Variety (January 31, 1935) "Photography is excellent"

Hollywood Reporter (January 31, 1935) "Photography of Norbert Brodine is excellent"

"ONE MORE SPRING" (Fox)

John Seitz, A.S.C.: Directing Cinematographer

Hollywood Reporter (January 31, 1935) "John Seitz photographed beautifully"

Daily Variety (January 31, 1935) "Photography by John Seitz is okay—"

"LIFE BEGINS AT 40" (Fox)

Harry Jackson, A.S.C.: Directing Cinematographer

Daily Variety (February 1, 1935) "Photography and production are both good"

Hollywood Reporter (February 1, 1935) "Photography by Harry Jackson, top-notch"

"RUGGLES OF RED GAP" (Paramount)

Alfred Gilks, A.S.C.: Directing Cinematographer

Hollywood Reporter (February 2, 1935) "Photography by Alfred Gilks very good"

Daily Variety (February 2, 1935) "Photography and production are both excellent"

"THE LITTLE COLONEL" (Fox)

Arthur C. Miller, A.S.C.: Directing Cinematographer

Hollywood Reporter (February 6, 1935) "—and Arthur Miller's photography is excellent—"

Daily Variety (February 6, 1935) "Arthur Miller's photography is good, especially when he focuses on Miss Temple"

Motion Picture Daily (February 7, 1935) "Arthur Miller's photography is good"

THE CAMERA'S OMNISCIENT EYE

(Continued from Page 93)

camera, and acute - perspective lenses are some of the more glaring faults All of these instrumentalities are of great intrinsic power when proportionately suited to becoming a part of a dramatic intensity sufficient to absorb their punch in a unitary balance of contributive stimuli

However, as the screen matures and the various dramatic and pictorial elements are unified, dramatic cinematography will be more incisively rationalized, and through this restraint and refinement the screen will gain a more consistent power of expression, since less of its substance and form will be wasted on content of insufficient intensity or disharmonious mood

There is another consideration while on the subject of the omniscient eye, that of "compression" While the camera sees and points out "the one right thing at the right time," it is implied that the one thing may be and usually is, the sum-effect of a number of contributive stimuli It is this intrinsic wealth of stimuli, plus the cinema's exceptional synthetic facilities, acting together, that pack into so brief a space of time such a rich field of experience for the percipient That is, through the concurrent interlocking and emphasizing of a number of pantomimic and literary symbols of specific human significations, with symbols of human, material, animate or inanimate, abstract signification, a great web of affective thought is generated in the percipient very rapidly within a few scenes Whereas, for the sake of comparison, if it were possible for a like mass of stimuli to be absorbed exclusively from the written or spoken word, many pages and much time would be consumed in arriving at the same juncture of percipient experience And, due to their relatively restricted type of stimuli, the written or spoken word alone cannot approach in intensity the vibrating brilliance of the highly compressed cinematic experience It is, again, this faculty of extreme compression which helps to give the motion picture such outstanding influence

Going one step further in our discussion, through the camera's omniscience there comes to the percipient not only the richness of things and thoughts derived through the senses, but of even more potent experiences derived almost entirely through imaginative construction For at certain times omniscient perception requires the complete or nearly complete cessation of physical activity or other stimuli on the screen and the continuation of cinematic movement within the percipient's mind alone, with infinitely greater effectiveness than actual screen representation Not only dramatically is the purely subjective most powerful, but oftimes, with regards for human sensibilities it is the one right way to interpret

In conclusion for each instant of the picture's duration there is but one best point of perception for the camera lens It is for the Director of Photography to understand the implications of the story's theme and philosophy, the psychology of the story's dramatic structure and of the story characters, during each of the synthesized moments of accurrence relative to the whole picture-percipient experience Thus, in the individual shot, the indicative and relative dramatic-pictorial factors intersect at a focal point, and this photo-dramatic optimum is **the one** set-up (static or mobile) for the particular subject-matter at the instant And, as the course of the story is raced through sequence after sequence, the cinematographic eye moves where it will in its omniscient seeing

So it may be said generally Always use that unique facility of participation inherent in the motion picture to the limit of its effectiveness, in order that the percipient realize the most pertinent and interesting ideas and facts in the story's evolution and substance (regardless of where the camera may be put to so record and interpret), **provided** there is a sustained "picture-audience unity of experience" Nor does it matter how varied the camera angles or how heavily they are punched **if** a consistently unself-conscious and rising cumulation of "illusion of occurrence" prevails

Photography Shauld Interpret Personality and Character

(Continued from Page 97)

to the study of proper lighting and backgrounds for the further developments of the subject's characterization It is due to this extensive and untiring effort on the part of the successful cinematographer that he is able to stay in the front ranks of the art of cinematography, in this field of ever-changing methods, new inventions, and radical and revolutionary introductions

It has often been claimed that cinematographers are born and not made This is partially true and partially false The cinematographer must be born with the ability to understand the psychological, dramatic and true characterization of the subject he is photographing On the other hand, he must learn, through study and research, the possibilities and the rational assimilation of the machine with which he is working Good cinematography is one of the best educations toward a rounded sense of reality Restoring to the eye, otherwise so preoccupied with the abstractions of print, the stimulus of things roundly seen as things, shapes, colors, and textures When this has been learned, the cinematographer will then be able to give shape and significance to the story's most remote symbols

The facts pointed to in the beginning of this article have been proven by my own career I was not born a DaVinci, or a Michael Angelo Although I, too, came from Italy, it was my lot to arrive in the United States an immigrant, without knowledge of the English language, and for less knowledge of photography in any of its phases Yet, through constant study and research of the then infant field of cinematography, managed to lay a foundation upon which my present career and theories are based It is, therefore, my belief, that any cinematographer to fully understand the true perspective of his art, must reach this understanding through past mistakes, made by both himself and others who delved deeply into the scientific field of cinematography

The cinematographer must have for the basis of this cultivation, a direct and immediate experience of living itself We must directly see, feel, touch, manipulate, sing, dance, communicate before we can extract from the subject any further sustenance for character If we are empty to begin with, the subject will be empty, and if we are passive, powerless and have not the feelings of the subject, how can we expect to inject into the film the one outstanding quality of motion pictures, human characterization?

Halter Places Stress on Detail

(Continued from Page 96)

to have on his sets in the way of set dressings, the color, textures and period the furniture and the other myriad of details that might be considered by many to be of no importance whatsoever

There is no production too big for Haller to tackle There is no such thing as too difficult, as far as he is concerned With his training and methods of living, obstacles, which might be considered insurmountable, can be overcome with detailed thought

Foreign directors, Haller believes, are the most difficult to please Primarily because they think differently than the

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American ones, due to the fact that their early environment has been, by necessity, so widely contrasted to the life in the United States

Again, this misunderstanding can be overcome by a detailed study of the person with whom you have to work This has been given careful thought by Haller because during his years of experience, he has worked with many of the leading foreign directors

He points out that if detail is wholly and absolutely observed in every instance, the other qualifications which go to making a motion picture a thing of beauty and entertainment, such as vitality, richness of settings, and true characterization of the subject will be brought out in more pronounced sharpness Because when the cinematographer strives toward detail he catches the one important movement which crystallizes itself out of the many unimportant gestures used in the course of the day

ARTISTIC HONESTY IN CINEMATOGRAPHY

(Continued from Page 94)

with, so essentially unreal in its conception that no effort could make it real in completion I could not, from the start, believe in the actuality of what I was photographing, it touched no responsive chord in my experience-memories, and accordingly I could bring to its realization only technique—not sincerity

It is entirely possible that in some other Cinematographer the same scene might have found the note locking in my individual experience, in which case, regardless of whether he treated it with greater or less technical skill than I used, I am sure the scene would have been more convincing on the screen

Of course, it is utterly impossible that any Cinematographer could have experienced situations and emotions absolutely identical with those of every scene he is called on to film· but his experience should be such that the majority of scenes will find some common factor in his memory Some factor, that is, which will suggest how such a scene should naturally look—which will enable him to visualize the scene in photographic terms You would not, for example, be able to correctly visualize the arrangement and lighting of a room in a modern home if all your life had been spent in an Eskimo igloo, you would be like a blind man trying to describe the color red! To draw perhaps a better comparison, how close could a man whose only experience of homes had been in the squalor of the slums come to portraying convincingly a scene laid in the home of a cultured millionaire?

This, I believe, is a factor too generally overlooked in all phases of production Our aim in making moving pictures is to present stories and scenes which give at least an illusion of actuality This illusion can only be attained when every phase of production—writing, acting, direction, settings and cinematography—strikes a keynote of sincerity based on experience In other words, when all of the artists concerned are artistically honest—with themselves and with their work

A vitally important—and neglected—factor in bringing this condition about is more closely coordinated preparation

Times without number I (and every other Cinematographer) have finished a production one evening, only to start another one the following morning On at least one of my recent films, I actually had no idea of the story until late the night before I started shooting! Under such conditions, no Cinematographer can possibly make his fullest contribution to the success of a production It would be immeasurably better all around if Cinematographers were allowed more thorough preparation for each picture—a chance to study the script, and to work closely with Director, Art-Director and Costumers in planning and coordinating the details of production, so that the whole might emerge a better and more unified piece of work This would probably result in fewer pictures per year for each Cinematographer — but they would be better and more successful ones Incidentally, such a practice would go for toward spreading employment in our craft

My own preparation for a picture, hampered as it usually is by insufficient time for tests, conferences and study is necessarily brief I try always to be familiar with the story, with the players I am to photograph, and with the settings and locations I am to use When I am working with a star I have not previously photographed, I naturally try to make at least a few photographic tests before starting production Before filming "Chained," for example, I had never photographed Joan Crawford, therefore my first step was to study with Miss Crawford some of her favorite portraits, in order that I might get an idea of how she wished to look on the screen Once I understood this, it was easy enough to determine the angles, style of lighting, and so on, required to present her in that fashion- Once more a case of first visualizing clearly how a thing should look, in order to be able to photograph it convincingly

In actual production, I make it a

point to pay as much attention to the treatment of the set itself as to the players. Essentially, of course, the set is simply a background against which the players enact the story, but it should be a convincing background. Therefore it should be treated with equal care. Actually a set serves two purposes. Not only must it be a convincing, believable background for the action, but it forms a vital part of the composition. Thus it should be lit not only with an eye to enhancing the effect of actuality, but to enhance the pictorial value. Careful attention to painting pictorial designs with light and shade upon set walls, for example, does much to heighten the pictorial effect, and if carefully done, does not in the least destroy the natural effect.

It is perhaps needless to say that the extent to which a Cinematographer can carry out his ideas depends greatly upon the Director with whom he works. Some Directors—like Richard Boleslawski, for instance—cooperate generously with the Cinematographer. Such a Director thinks in terms of pictures as well as action or dialog, accordingly, he sees to it that the Cinematographer understands the story and its aims quite as thoroughly as he does—and that there is ample time and cooperation for the production of every photographic effect that will make the film more perfect pictorially.

Other Directors may concentrate their attention on action or dialog, and more or less accept the Cinematographer as a matter of course. Others still, while not directly interested in the purely pictorial phases of the production, none the less realize that the camerawork is important, and cooperate largely for the mechanical perfection such cooperation makes possible. Each, in his own way, helping the Cinematographer to turn out a smooth, consistent, and uniformly well-photographed production.

The most difficult to work successfully with are the few who do not, apparently, visualize clearly themselves. It is like sorting out a jig-saw puzzle, for some where in a confused discourse upon the shortcomings of the casting-office, the merits of Saturday's football game, the blonde he dined with last night, and fragmentary comments upon scene and

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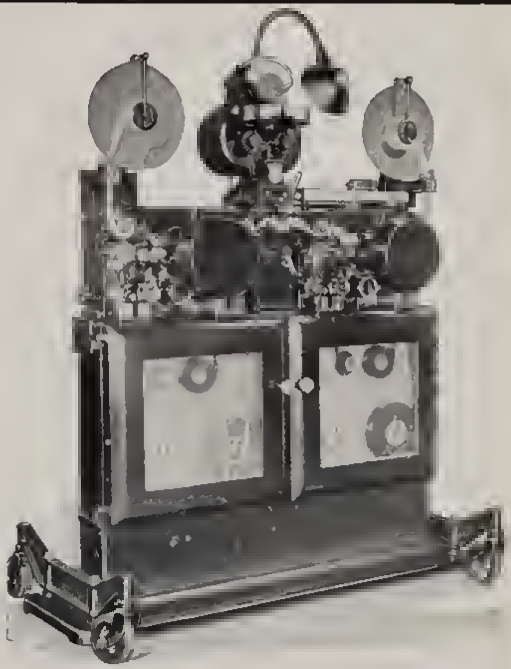

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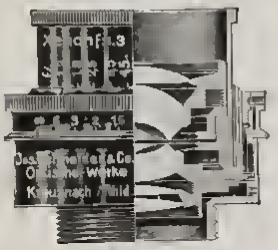

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script, is an idea of what he expects in the scene It is interesting mental exercise, trying to find that idea—and forming a clear mental image of what is wanted!

Under ordinary conditions, success in Cinematography must naturally depend upon a number of circumstances upon getting stories which allow some degree of artistic expression, upon adequate preparation, and upon a thoroughly cooperative Director But most of all, success depends upon the individual Cinematographer's reservoir of experience, which should illumine his treatment of every scene, and upon absolute artistic honesty with himself and with his work

High Intensity Mercury Vapor Lamp for Photographic Applications

(Continued from Page 93)

Portrait Work

The value of the new lamp in this field is problematical To be sure, the older mercury vapor tube was one of the standard illuminants for portrait photography, and on the same basis the new lamp should prove equally effective However, many photographers who are now employing portrait panchromatic films prefer an illuminant having all colors as it greatly reduces the amount of re-touching necessary The slow start probably would not be objectionable owing to the time the subject requires to get ready

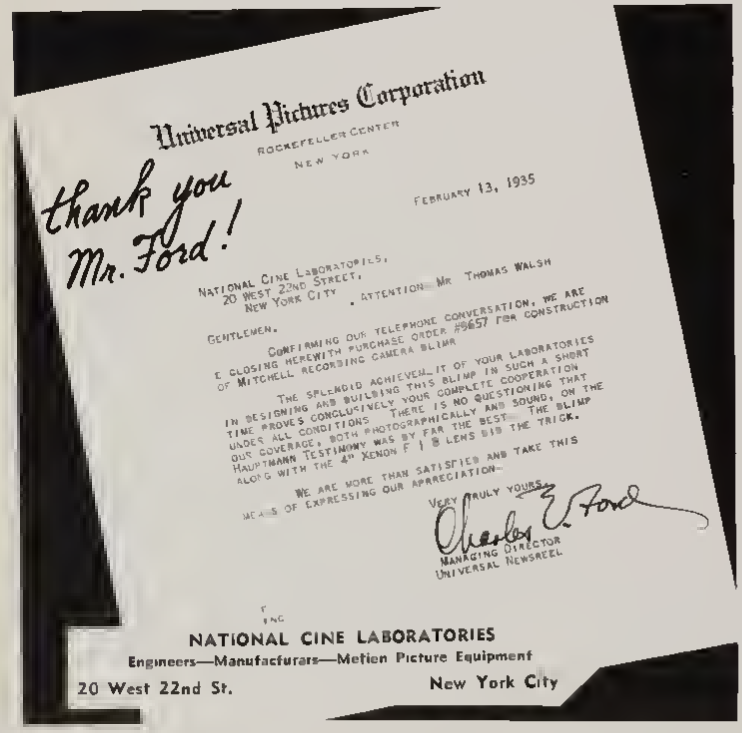
Color Photography

Owing to the practical absence of some colors, the mercury vapor lamp is quite unsuited for color photography if used alone

It is entirely possible that the high intensity mercury vapor lamp could be used in those applications such as portrait and commercial photography, as well as color work, if some other source such as MAZDA lamps were incorporated in the equipment to fill in those parts of the spectrum where the mercury source is deficient It would be necessary to enclose both illuminants in the same diffusing globe to prevent color shadows

There are at present no reflectors available for the high intensity mercury lamp designed especially for photographic applications Undoubtedly photographic manufacturers such as Johnson Ventlite Company, Holldorson Company, or Burke & James, all of Chicago, will place equipments on the market as the demand arises The mercury lamp can, however, be used quite successfully in either the R L M or the deep bowl aluminum reflectors designed for the 1000-watt PS-52 bulb lamp, with only a slight broadening of the light distribution Of course these reflectors are best adapted to a downward direction of the light on account of the burning position of the lamp For the copy board lighting, some form of trough reflector would be best suited

On account of the weight of the control equipment the high intensity mercury lamp is limited to fixed installations in the studios



Will Color Help or Hinder

(Continued from Page 100)

"Up to now, of course, the Industry has been anything but color-conscious It has operated upon a black-and-white basis, and accordingly its people have trained themselves to think in monochrome Now that we have color—and very good color—to work with, we must learn to think in terms of color But color does not mean an abundance of color this cannot be too strongly emphasized

"In other words, Cinematographers, Art-Directors and Directors must learn to compose their pictures in color, as well as in line, mass and chiaroscuro In this, I find that most people have quite a wrong idea of what constitutes a colored picture Suppose we have an ordinary shot of a man in a room to cite an extreme instance, some people would consider it enough to give the man a red necktie, and perhaps to put a bright carpet on the floor, or brilliant paintings on the walls In the true sense, this is NOT a true color picture, even

though the camera would reproduce the scene perfectly In a true color picture, there must be a definite chromatic harmony between every bit of color in the frame—between the tie, the walls, the carpeting, the drapes, the furniture, and so on Moreover, these factors must be arranged to give a good composition, not only in line and mass, but in color

Cinematographers are accustomed to making their black and-white compositions with feeling—composing with line, light and form to develop and enhance the complex combinations of feelings summed up as 'mood' The same thing can and must be done in color-composition

'Our language includes innumerable phrases linking color with the emotions —'crimson with passion'—'green with envy' 'white with fear'—'blue and dejected'—and so on The very lack of color suggests a dull, drab emotional state All of this must be taken into consideration in planning and filming color pictures Color must be used, not only as color, but as a dramatic emotional tool, to build and maintain mood and this, in conjunction with painstaking composition in color

"All of this indicates that creative film-workers — especially the Cinematographers and Art-Directors—must develop a positive color-sense, or step aside for those who have such a sense Since established film workers have had to train themselves to think in black-and-white rather than in color, they are starting out under a fearful handicap, for they must utterly revise their mental processes if they are to keep step with the progress of the Art I am not the only person in the theatre who has a reputation for thinking in color (though it is my good fortune to have been selected as the first color-consultant), and I am sure that if this picture succeeds as we believe it will, there will be a tremendous influx of stage colorists

The only living Director who has worked with trichrome on a full dramatic feature is Rouben Mamoulian, who succeeded the late Lowell Sherman as Director of 'Becky Sharp To him, color is an adventure—and a promise 'I enjoy this assignment tremendously," he told me 'Probably a great part of it is the thrill of consciously pioneering in a new field but on the stage before I entered pictures, I always tried to make the dramatic and emotional use of color play a vital part of my work—and I have missed its aid in making pictures

"Color is at present in about the same stage of development as was sound when the first talkies were made it is mechanically well developed but no one has used it enough to be fully conversant with the artistic technique of applying it constructively to production That is why we are going slowly and carefully on this picture, which is really

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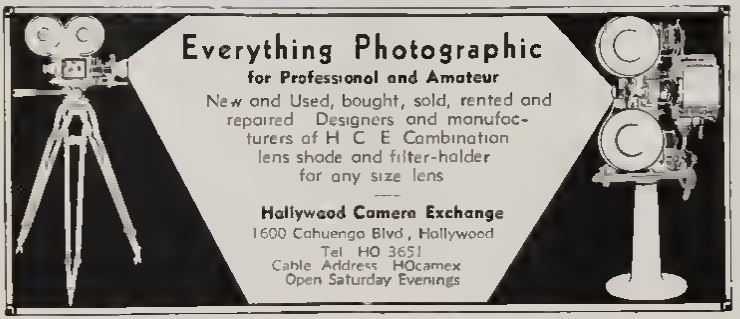
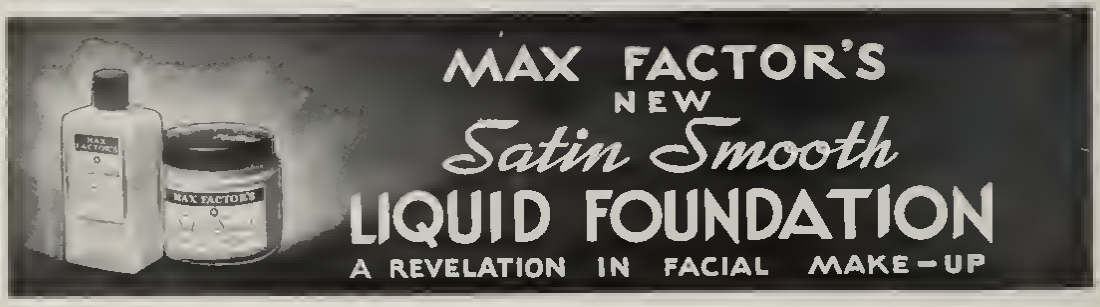
"Do you remember when the first talkies came out how carefully we recorded every slightest noise that might be natural' — every footstep, every rustle, every door-slam, even to eggs sizzling in a frying-pan? Well, up to now, color has been in exactly the same stage of development we have had the means of bringing color to the screen, and we have taken pains to see that it gave us plenty of color From now on, we must be selective, using color intelligently, for its dramatic, emotional value as well as for pictorial purposes

'I do not find that color—rightly used—conflicts with the dramatic elements of the story It doesn't on the stage, no more should it in films, unless we make it do so by using it unwisely Sooner or later, the majority of important pictures will undoubtedly be made in color Up to now, the moving picture industry has been like an artist who was allowed only to use pencil or charcoal, now Technicolor has given us paints In Art, there is a place for the monochrome line-drawing, even though color, in the form of oil paintings and aquarelles, is predominant It is the same in pictures color will undoubtedly become the dominant medium, but there will none the less be a place for the black-and-white film for some subjects, even as there is a recognized place for etchings There will always be some stories which will be more fittingly told in monochrome, just as some stories (like 'The Last Laugh') even today would gain nothing from the addition of sound

"The main thing today is not to get excited over color to the point where enthusiasm for color overbalances what we have already learned about film craftsmanship In this initial period, it is only logical that we should use color on films whose subject and background offer, as in 'La Cucaracha' and 'Becky Sharp,' the greatest opportunities for effective coloration but eventually we will surely find that the use of color—in costuming, in settings and in lighting will be a definite aid to putting over dramatic and emotional effects in any picture, just as are lighting, composition, and tempo already"

Cinematographer Ray Rennahan, almost the only trichrome Cinematographer, definitely approves of color "I like color cinematography" he said, "especially in this new process It gives you a chance to develop effects of mood and actuality that can't be approached in black-and-white Of course, we are largely back to arc lighting—but we used arcs before, and a lot of us complained when Incandescents drove them out





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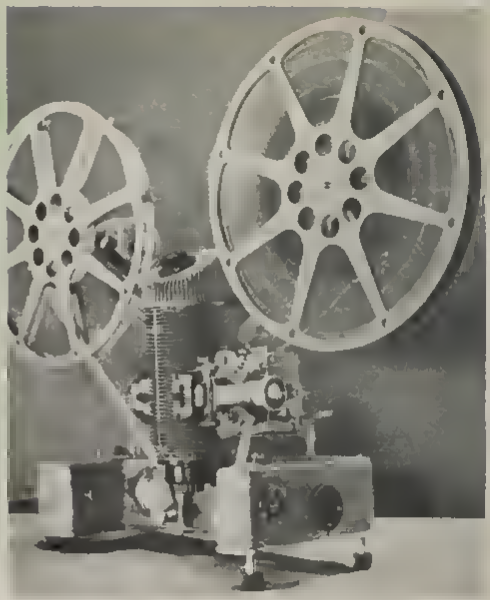

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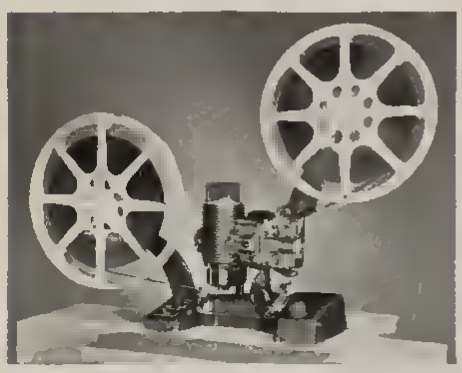

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AMATEUR MOVIE SECTION

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- Clyde DeVinno, A S C , will tell you how to use your library, what to read and how to read books on photography There is much you can learn about photography from books, DeVinna leads the way
- Groce will give us his second article on Makeup In addition to that we have another article from him that he has called Perfection in Projection It will interest you
- Naturally there will be many other interesting articles and hints for the ambitious amateur

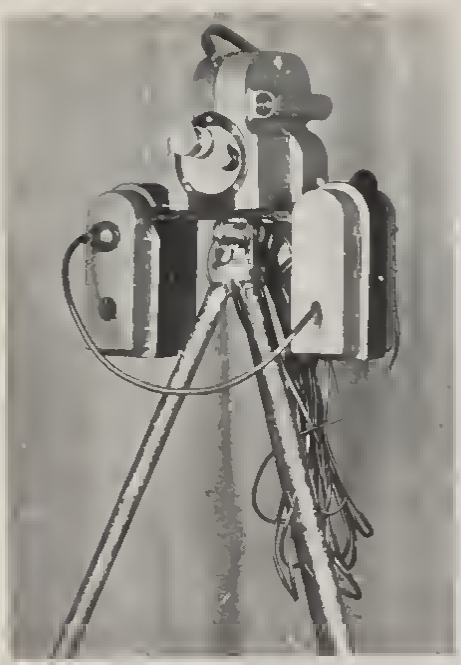

Fig. 1. A general view of 16mm sound and picture recording camera

Methods of

IN THE earlier stages of 16mm sound-picture progress, the larger part of the research was concentrated in the development of sound-on-disc equipment. However, the bulk and weight of such apparatus, coupled with the difficulty of securing proper synchronization between the disc and the film, turned this interest toward a sound-on-film system. A combination of sound and picture on the same strip of film was then proposed to secure exact synchronization and to reduce the bulk of the entire equipment. At first those engineers who were involved in the realization of such a scheme found themselves confronted with the seemingly impossible problems of design, weight, cost, dependability, and simplicity of operation of such apparatus. Despite all the unfavorable comments and predictions, most of these problems have been solved one after the other.

At the present two important and distinct methods are used in producing 16mm sound-on-film pictures. In the first, sound and picture are recorded simultaneously and directly on a single strip of film by means of a specially constructed 16mm recording machine. A general view of such a camera with its auxiliaries, built by RCA Victor Company, is shown in Figure 1. In the second method 16mm prints are made from the existing 35mm films using either re-recording or optical reduction of sound. This article will present a discussion of the latter of these two methods of producing substandard sound-on-film pictures.

Optical Reduction of Picture and Re-Recording of Sound

One of the two principal processes of preparing 16mm sound-on-film pictures from existing 35mm films consists in recording the sound and photograph on a 35mm negative and preparing a positive print from it in the usual manner. The picture of this print is then reduced by optical reduction and its sound track is re-recorded onto 16mm film. The final 16mm positive film is obtained using the reduced picture and re-recorded negatives in certain printing processes which will be explained below.

According to the standards adopted by the Society of Motion Picture Engineers the dimensions of the standard 35mm sound film camera aperture are 0.868 by 0.631 inch while the corresponding dimensions on the standard 16mm sound film are 0.410 by 0.294 inch. Computing the reduction ratios in the two directions, it will readily be seen that different optical reductions are required in the horizontal and the vertical axes. Due to the introduction of such a difference in reduction ratios it is necessary to use a special optical system employing cylindrical lenses.

Furthermore, as the gap between successive picture frames in the standard 35mm sound film is 0.117 inch and the corresponding gap in the case of the standard 16mm sound film is only 0.006 inch, which is only a very small fraction of the first, it is not possible to make use of the continuous optical reduction printing when a dupe (duplicate) negative is not available. For this reason a specially constructed printer is devised, known as step-printer, which prints the optically reduced picture on the 16mm film frame by frame.

The re-recording of the sound on 16mm is very similar to the original recording of sound on standard film and is accomplished by a recorder which closely resembles a reproducer. A light ray, traversing the already recorded sound track of the standard film, produces light variations corresponding to the variable densities or variable areas of the sound track. These light variations falling on a photo-electric cell create electrical impulses which in turn are transformed to light variations by means of a glow lamp. The alternating optical exposures so produced leave impressions of a new and reduced sound track on the 16mm film.[1]

The optical reduction of the picture area and the re-recording of the sound track are usually made on separate strips of films. If the two operations are impressed on the same ribbon of film, a master 16mm sound-on-film is obtained.

Continuous Printing of Sound and Picture

The 16mm master negative carrying the combined picture and re-recorded sound, or the separate picture and

Producing 16mm Sound Films from 35mm

Re-Recording and Optical Reduction

by
M. Margossian, B.S. (E.E.)

Fig. 2a. A general view of a Bell & Howell printing machine and at right, Fig. 2b, an enlarged view of Fig. 2a showing the location of printing mask

sound films, are used in preparing the final prints by means of printing machines. Figure 2a represents a general view of a Bell & Howell equipment which performs such a printing operation. Figure 2b is a close-up of the section of the same machine where the printing proper is performed. The printer is equipped with a three-way mask allowing either the picture area, or the sound, or both to be printed together. The setting in this particular case, as shown in Figure 2b, is for printing sound only. Obviously, both sound and picture can be printed on the one printer light setting when a master 16mm sound-on-film negative is available. With this equipment it is found preferable to use separate sound and picture negative, thus involving a double printing operation.

A similar equipment, produced by E. M. Berndt of New York, is shown in Figure 3. The apparatus again is designed to make a combined picture and sound print from either a combined picture and sound negative, or separate picture and sound negatives.

Summarizing the above, it may be seen that three different operations are involved in producing 16mm sound films when a 35mm print is available.

(1) An optical reduction which consists simply in optically reducing the picture area of a 35mm print to fit the smaller picture area allowed for in 16mm raw stock.

(2) A re-recording of sound which is merely the making of a new recording on the 16mm film from the 35mm.

(3) And finally, a printing operation which transfers the sound and picture of a master 16mm sound-on-film onto a positive 16mm film stock through a direct printing process.

Optical Reduction of Picture and Sound

In the second method of preparing substandard sound pictures from existing standard films, both the picture and the sound are reduced optically.

The optical reduction of the picture, as explained above, is accomplished by using an optical reduction step-printer.

The optical reduction of the sound track, however, is performed by continuous optical reduction printing.[2] Figure 4 represents the original design of such a printer invented and designed by A. F. Victor. The upper reel contains the

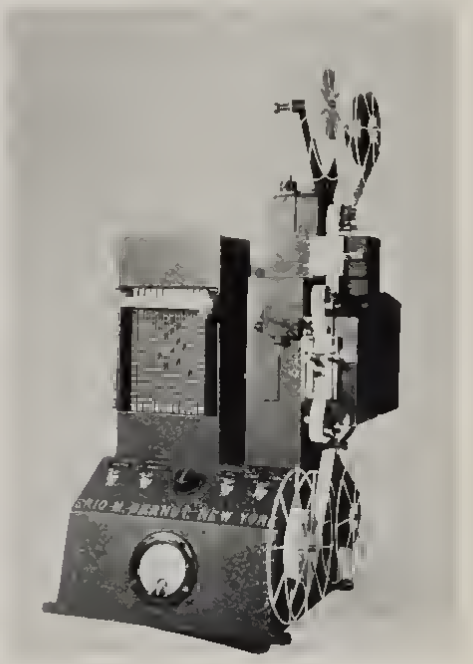

Fig. 3. Berndt Sound Printer designed to make combined 16mm picture and sound prints

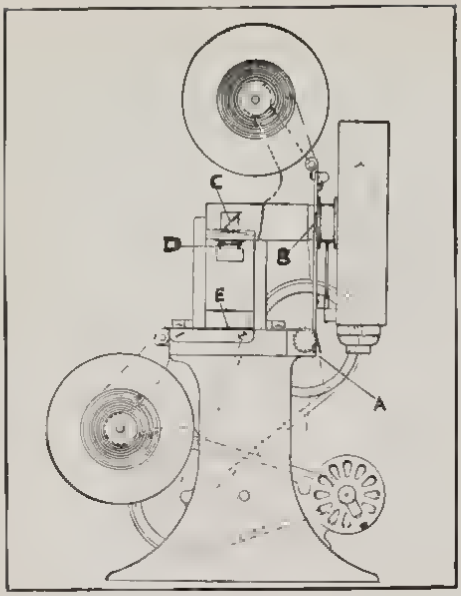

Fig. 4. Original design of continuous reduction printer made by Victor Animatograph Corp.

standard 35mm film, which is carried down past the slit B and wrapped around the sprocket A. As the standard film passes the slit B, the light beam is carried from this slit to the prism C where it is deflected downward through the lens D, the focused image of the frequency variations striking the point E. During the same time, the 16mm film, traveling horizontally through E, has the image of sound impressed on its track. Passing through E, the impressed 16mm sound film is carried on to the sprocket A where it is wrapped around a smaller diameter sprocket. The mechanism of modern reduction printers is somewhat different from the above equipment, but the basic principles involved in all of them are essentially the same.

Like the optical reduction of picture area, the reduction ratios of sound track in the longitudinal and transverse planes are different. Hence, an anamorphote or distorted-image-producing optical system is used, employing a combination of cylindrical and spherical lenses, or simply a pair of cylindrical lenses with an achromatic microscope objective disposed between them. Figure 5 represents the schematic diagram of such a system as used in RCA Victor Company's model reduction sound printer.[3]

In general, one of the following three methods is used to obtain the final 16mm sound-on-film prints by optical reduction of sound and picture:

(1) If the original master negative is available, the 16mm final print may be obtained by two direct optical reduction processes of picture and sound. Undoubtedly, this is the best method of making 16mm films as it involves less operations and preserves the quality of 35mm sound better, eliminating all contact printing operations which would otherwise bring a definite loss in high frequency waves.

(2) Usually, the original master negative is not used in preparing prints to be released. Instead, a contact positive print is made from it on 35mm film stock. From this print a 16mm dupe negative is prepared by optical reduction, this dupe is then used to print the final 16mm prints with the aid of one of the printing machines as outlined above.

(3) A third method consists in preparing a dupe 35-mm negative from which the 16mm prints are prepared by optical reduction. By this process the quality of sound preserved from 35mm would be somewhat better than in the preceding method since it involves one less printing operation.

From the above discussion it may be concluded that optical reduction of sound and picture is a simple process of producing 16mm sound-on-films from existing 35mm stock since it involves comparatively few operations. When a 35mm dupe negative is available, the 16mm print is obtained by:

(1) An optical reduction of picture, using step printing, and

(2) An optical reduction of sound, using continuous reduction printing.

Aside from its simplicity, this process, with its optical reduction of sound, yields somewhat better results than the first method where sound is re-recorded. It yields better results because it eliminates certain contact printing operations, thereby reducing losses of high frequency waves which are inherent to all contact printing.

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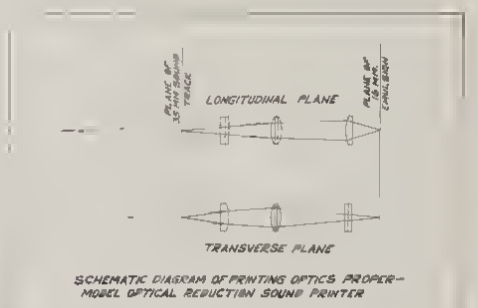


Fig. 5. A schematic diagram of anamorphote optical system of model reduction printer.

Tips on Home Projection

by

Ormal I. Sprungman

IF YOU project in your living room and do not own a suitable screen a creaseless, water-soaked bed sheet, wrung out and hung up in a doorway will serve nicely in an emergency Films can also be shown on light unpatterned wallpaper or dull walls, although some picture-luminosity will be lost Use tracing linen for a "daylight screen" Set the projector **behind** the screen and give the film half a turn before threading During the winter months, try projecting your movies through an open window on a smooth bank of snow for a novel effect Scenes of swimming, sun-bathing and various summer sports will probably give your audience chilblains when viewed on this cold screen background But it's worth a try

There are many excellent screens on the market, but among the movie-making fraternity there are always several home-workshop enthusiasts who like to make their own accessories For such amateurs, we suggest a combination silver and beaded screen, ideal for ordinary family group projection, which can be built inside a discarded 18x24 inch picture frame

Remove the glass and picture-backing Refinish the wooden frame a dull black- Hinge the upper left corner of the top of the frame and "slat" the back so that after the top is raised, a square of cardboard or plywood, silvered on one side and beaded on the other, may be inserted in place Such a screen may be mounted atop the table or on the back of a door so that when the door is opened against the wall, the screen is hidden from view Silver screen paint, obtainable from film supply dealers, is applied in the usual manner In making a beaded screen, the surface is white enameled and tiny glass beads sprinkled over the half-dried paint The coating must be applied evenly Superfluous beads may be wiped off after the enamel has dried To eliminate eye-fatigue, mount blue or purple-tinted Christmas tree bulbs on the back of the frame so that the soft light will make the screen stand out in relief

If the projector is not kept in the same line with the screen, a distorted picture will result In certain cases, however, this stunt can be used to give variety to your shows By moving the projector to the right or left of the screen, short thick images result By placing the machine above or below the screen level, the picture will be thrown at a tangent, thus exaggerating the height of the film characters

Incidentally, the "best seat" in your showhouse can be determined by the following formula devised some time ago by experts from the Massachusetts Institute of Technology-

$$\text{"Best seat"} = \text{distance of projector to screen} \times \frac{\text{focal length of camera lens}}{\text{focal length of projector lens}}$$

The projector must, of course be kept in good condition It should be oiled regularly but not excessively or the film will become dirt-streaked The film track and gate should likewise be kept clean to prevent film-scratching Torn sprocket holes should be repaired at once and brittle reels moistened to avoid breaks A felt pad or piece of inner tube placed under the machine will help to eliminate noise and vibration

Black and white films may be projected in color by slipping yellow or red filters used for "still" camera work over the barrel of the projector lens Likewise, a diffusion disc held in front of the lens will give pleasing, soft-focus results during projection- To "tone" a scene, allow a colored spotlight to flood the screen while the projector is running The white in the film will remain unchanged, but the black, shaded portions will be replaced by the color of the spot light Beautiful effects can be secured in this way by varying the colors

Another method of projecting movies in color is by using an easily constructed "color wheel," which is made by removing the core from an empty 100-foot 16mm movie reel, covering the four openings with colored gelatine paper and placing the two sides of the reel flush together If necessary, enlarge openings slightly Next, mount the wheel in front of the projector lens so that by rotating the wheel, the light will pass through the tiny openings Let one of the holes remain clear for ordinary scenes Cement a light blue square of gelatine over one opening for cold winter scenes or night shots Use yellow for thin daylight scenes Over the upper half of the fourth opening cement a red piece, and over the lower half a green square for two-color variations in projecting beautiful sunsets and landscapes Other colors may be used to suit individual tastes

By setting a flawless mirror at a 45-degree angle in front of the lens and giving the film half a turn, it is

(Continued on Page 128)

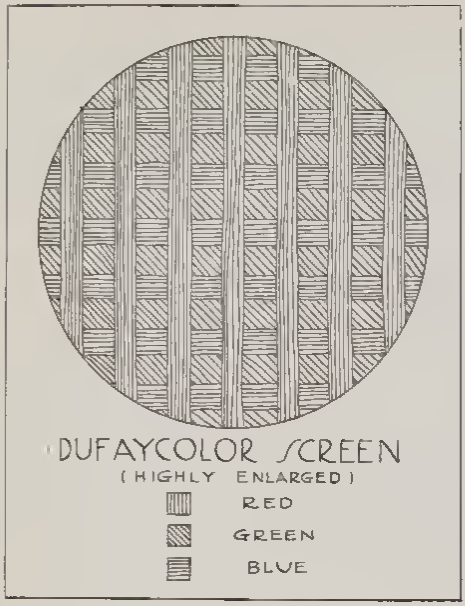


Fig 1

Dufay Leica

AT THE conclusion of an article, COLOR and the MINIATURE CAMERA, written for this magazine last April, I stated that in all probability any new, important development in color photography would be applicable to the miniature camera

This prediction has now been borne out, with the announcement that Dufay Leica Colorfilm will soon be available for miniature cameras using 35mm film Although Dufaycolor film has been perfected primarily for use in the motion picture field, its first real commercial application in this country will be with its use in miniature cameras

Both the advancement of color photography and the miniature camera user shall benefit from this decision of Dufaycolor Ltd of London, to make Dufaycolor immediately available from the many Leica dealers throughout this country by the appointment of E Leitz, Inc, as sole distributors of this film for miniature camera use Surely this decision must come from the recognition of the important part that the miniature camera has played in the advancement of photography, during the past few years and from the belief that color photography under this same spirit of enthusiastic progressiveness, will likewise show marked advancement

What is Dufay Leica Colorfilm? Perhaps a description of this film, here at this point, will do much toward dispelling the fears of the uninitiated that Dufaycolor is likely to be a complicated process, much too technical for his or her limited technical knowledge to master However, that is not the case, for if you can make satisfactory negatives for black and white photography, then with no more trouble or extra camera equipment, you can make satisfactory color pictures Dufaycolor does not require any special lenses or alterations to the camera Also no filters are required for exposures made by daylight I have used all of the different focal length Leica lenses with this film, with splendid results Focusing these lenses by the conventional manner of using the range-finder, I found that NO allowance need be made under all normal conditions, for the fact that the film is loaded into the camera with the celluloid side toward the lens

Dufay Leica Colorfilm comes in the conventional daylight loading roll of 30 exposures This roll is loaded in the camera in the normal manner It will, however, be noticed, that the film is so spooled that the celluloid or shiny side of the film will face the lens (The reverse of black and white procedure) This method of loading permits the color screen, which is an inherent part of the film, to act as color filters for the panchromatic emulsion with which the film is coated Dufay Leica Colorfilm may be used in any of the miniature cameras that use 35mm film, viz Leica, Contax, Super-Nettel, Peggy, Retina, etc

Although Dufaycolor is a single film, it is made with two distinct coatings, the color screen and the emulsion The color screen, or reseau as it is termed, is first printed upon the celluloid film base This reseau has a distinct pattern as is shown by Fig 1 There have been several different patterned color screens used for Dufaycolor The reseau shown in Fig 1 is the type of screen that is now in use for film coated in this country by the DuPont Film Mfg Corp for Dufaycolor Ltd

It will be noticed in Fig 1 that alternate parallel lines and squares of color form the reseau These rulings are so fine that they cannot be perceived by the naked eye There are about 1000 of these rulings per inch, or about 1,000,000 color units per square inch The drawing shows these rulings as they appear under a 235 power microscope When Dufaycolor film is projected from a stereopticon, the pattern formed by the rulings is noticeable only upon very close inspection of the projected image From the normal viewing distance of the projected image, at no time are you conscious of any color screen pattern The images are extremely sharp with a pronounced stereoscopic illusion and possess a charmingly artistic appearance

After the color screen or reseau has been printed upon the celluloid base it is covered with a layer of synthetic resin This isolates the reseau from the emulsion, thereby preventing the dyes of the screen from diffusing into the emulsion during the film's subsequent development and reversal Over this layer of resin is applied the highly sensitized and well color balanced panchromatic emulsion

The principle by which Dufay Leica Colorfilm makes pictures in natural colors is very interesting It is based upon the Newtonian theory that the spectrum may be split into three primary colors, viz red, green, and blue-violet These are the three colors that are used in the Dufaycolor reseau Fig 2 shows how Dufaycolor reproduces the colors of the visible spectrum and also black, grey, and white The letters R, G, and B in Fig 2 indicate respectively the red, green, and blue-violet filters of the reseau

When a strip of Dufaycolor film is exposed in the camera, the following action takes place The minute color filters in the reseau pass some color rays wholly, or par-

Colorfilm for Miniature Cameras

by

C. W. D. Slifer, A.S.C.

Alfred O. Trnegerm, president of E. Leitz, Inc., who this year celebrates his twenty-fifth anniversary with that organization.

tially, or stop completely others, depending upon the color of the light ray and upon the filter or filters that it falls upon. In this transmitted ratio they affect the panchromatic emulsion immediately behind the reseau. This emulsion during the course of development and reversal becomes a positive. Thus when this positive is viewed by transmitted light, it permits the light to pass thru the color screen or reseau in the exact and original ratio, thereby giving a picture in natural colors. See Fig. 2.

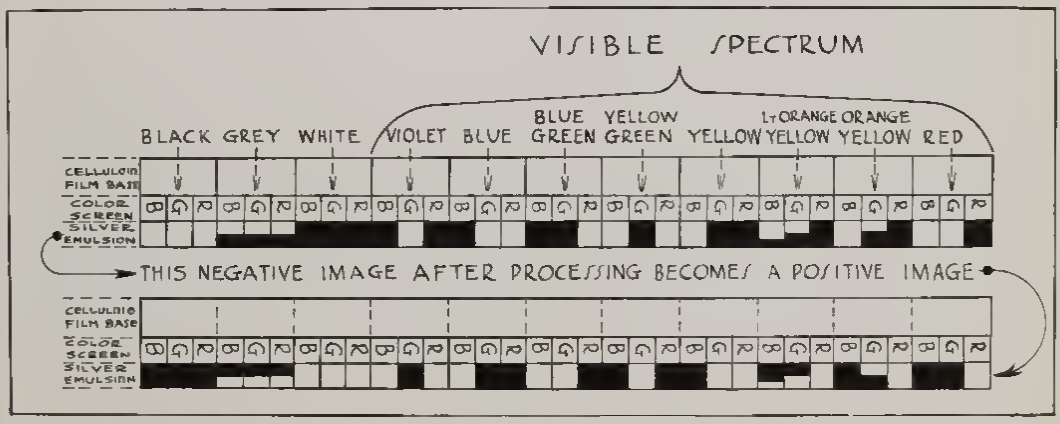
The exposure required for Dufay Leica Colorfilm coated with DuPont panchromatic emulsion in this country, is approximately one lens stop greater than that required for black and white photography. However, as this particular emulsion does not require the use of a color filter when exposed by daylight, it becomes as fast as black and white, super-sensitive panchromatic film, when this film is used with a filter in order to secure a true monochromatic rendering of the same object.

Correct exposure is the one essential in good color photography and the greater the contrast of your subject the more necessary it becomes that your exposure is correct. The intelligent use of a good exposure meter is to be recommended. The Scheiner speed of this film is estimated at about 16 or 18 degrees. However, the speed of this film depends greatly upon the color of the light. I have made satisfactory exposures on Dufaycolor film at 1/500 part of a second and also with a hand-held camera, I have made exposures of ¼ part of a second at f2.0, long after sundown, shots of twilight silhouettes, street scenes, etc. So now for the first time we have a color process of sufficient speed to permit us to make color photographs under a large variety of conditions.

The processing of Dufay Leica Colorfilm is simple enough that all of those miniature camera enthusiasts who now develop their own black and white negatives may do it with good results. However, for those who do not care to process their own film, the many dealers that will distribute Dufaycolor film will be able to do it for them. At this point I wish to express my thanks to Messrs. Gilbert

(Continued on Page 127)

Fig. 2



Makeup material with Max Factor instruction pamphlets

Dabbling

FOR THE past twelve months, this author has treated only the mechanical side of cinephotography—trick titling animation, double exposures, speed control, lens and filter tricks—a side which I hope has appealed to the more technically-minded of my readers However, by no means is cinephotographic perfection only possible from the camera manipulation, so, to round out the work, this series on makeup may prove of some value

Some months ago several readers suggested that something along the lines of motion picture makeup might prove valuable to the amateur filmer, especially since so little is known or has been published in amateur magazines Altho I knew some of the groundwork of stage makeup from experience in the little theatre, movie makeup was a very different thing, and the thought filled me with fear and trepidation However, nothing tried, nothing learned so off went a letter to Max Factor to find out what it was all about

Max Factor Co sent a dozen little booklets containing hints on the art of makeup, and after some study of the probable types to try for this series, the following list of materials was obtained The last four items, however, were from the dime store

Grease Paints (tubes), pancro No 21-29 inclusive
Face powders (cans), of corresponding numbers to the paints
Shadows (small tubes), pancro No 6, 21, and 22
Lip rouge (small boxes), light, medium, dark, studio special
Eyebrow pencil, brown
Black masque, in box with brush
White masque, in cake form
Nose putty, two sticks
Tooth enamel, one bottle each of white and black
Spirit gum, with self-contained applicator in bottle
Crepe hair, a yard each of black, brown, and white
Paper liner sticks, two dozen
Face powder brush.
Powder puffs, combs
Box of cotton cleansing pats, about 3" square
Small bottle of "new-skin" (colladion), with applicator
Patches of "sticking plaster" (**not** adhesive tape)

You will find most of your movie makeup requirements will be pretty well taken care of with the materials just listed, and you will find also that these materials will last for quite a bit of makeup, because makeup is used sparingly for camera work Naturally, you might want to go in for wigs after the straight makeup is under control but let's let the future take care of itself for awhile yet

In the booklets of Max Factor are shown several makeup cases, but after looking at the list of materials, we decided that none of the ready-made cases would hold all of it, and besides, we thought it would be possible to build in the lights and make it possible for two of us to make up at one time, so the case shown in the illustrations was designed and built We've found it a most convenient carrying case as well as useful makeup case, because it's only 12" high and long, and 8" thick when closed The weight loaded is about ten pounds

The nine cans of face powder are stowed away in two sections, the cover of one carrying nine tubes of grease paint in canvas pockets Other compartments hold the various smaller bits of materials, with removable covers, Two mirrors are so hinged that when an evening of making-up is to begin, excellent work before two lights can be done by two people at once

It is not the intention of this, the first article of the makeup series, to sell either Max Factor makeup materials or the special makeup cases we made up However, I believe you will find the quality of the Max Factor line so excellent and the convenience of the type of makeup case we built so inducive to many evenings of most interesting work that you'll buy the makeup materials and make your own case You won't be able to learn about movie makeup in one night, nor in two, nor in half a dozen, so by all means make your layout as convenient as possible, and if you live in an apartment as we do, make it so it can be packed away

When I was connected with the little theatre during my college days, we used grease paint which came in long sticks It was necessary to smear cold cream on the face

The makeup kit opened with mirror and lights in place

in Makeup Materials —Part One

by
Wm. J. Grace

before the grease point was applied, and the point was so thick one felt as if he were wearing a mask Consequently, he was afraid to act naturally, because the paint "might come off" If you have had no experience with the newer Max Factor makeup, you're in for a delightful experience after having messed with the old thick paint. The new paint is as soft as toothpaste, and it comes in tubes just like toothpaste Furthermore, you need to use only about a quarter of an inch of the paint—the same amount as you'd squeeze out of the old toothpaste tube

There's quite a trick to applying the paint, as we'll see That trick will be explained in next month's article, under the principles of makeup foundation There is this to look forward to — this new grease paint will spread thinly, smoothly, and evenly, with absolutely no discomfort to the face of the most sensitive user You won't feel at all as if you were wearing any "paint"

In this series of articles we are not going to attempt to approach what might be termed a high degree of professional work We want, however, to see just what limitations there are for the amateur in spite of the fine materials at his service and in spite of the many reams that have been written about makeup

You see the amateur approaches a technical subject, and makeup is technical, from a little different mental view-point Some go at it with a bit of trepidation, while others assume it is as easy as washing your face

Max Factor in his article in the Cinematographic Annual Vol I made this statement, "Makeup must start where nature left off" This is where we want to build types, where we must erase defects, that is things that will look like defects to the camera

We read of cinematographers who recommend that the plain street makeup be used Well, we amateurs are not clever enough with the camera, with the effect devices, to offset any blemishes our photographic subjects might have, so we must turn to makeup, and to learn about makeup we must use it, not accasionally, but often Like anything else we may desire to do and do well, we gain perfection by doing and not by wishing

But there isn't room left this month to do more than to invite you to write Max Factor, ask for his booklets and price list of materials, and then place your order and fix up a place or a case to try them out By the time you've done these things, next month's article will be in your mailbox and we can try some of the makeup

Top photo shows convenient size of makeup case. Next photo shows case open, next with mirror and lights in position and bottom photo shows how the case can be used by two people.

Editing Saves Many Films

From Soup To Nuts

by
Ed. J. Ludes

ARE you gentle reader cursed (like me) by insurmountable projection difficulties? I, for instance have but one projector and the time between reels is always an agre—something to be feared True, my audiences, like yours, are usually polite and condone those disgusting pauses simply because they have to, but this does not lessen the fact that a few minutes screen time is interspersed by nearly as much intermission between reels I have spliced many of my subjects together and put them on larger reels but I find that I cannot do this to any great extent since my subjects vary in interest

My racing pictures may be of interest to some of you, but there are those who care not a fig for them, yet would laugh with glee at the comedy I made during my vacation And it's hardly fair to wade through 200 feet of racing stuff to show the comedy and vice versa Of course, if I plan on showing the pictures beforehand, I could splice the film in decent order and show 400 feet at a time—BUT! I find that I show pictures most often on the spur of the moment—someone suggests a show—we set up the screen in one room, the projector in the other and shoot between the doors!

Now like all good amateurs I have a variety of subjects Too many, in fact That is why I have a lot of 100-foot rolls on hand. So I decided to do something about it I'd read of how to save miscellaneous shots and make a completed reel out of them, but that was not my specific problem. I had to save miscellaneous REELS and make a SHOW out of them! My solution lay in approaching the subject from a different angle than anyone has heretofore attempted I decided to write a show and then use as many shots as I could out of what I had (or could get) Here is the final reel:

Main title

JOHN FILMER PICTURES
presents
"FROM SOUP TO NUTS"
A complete movie show
in 15 minutes

This was printed on a card and arranged to "swing" to one side after being read, thus exposing a new title behind, which read

FILMER NEWSREEL
"The Glass Eye At The
Keyhole Of The World"

A quick title change brought

DAISY'S MAN WINS SHAVING CUP

Champion Takes Coveted Trophy From Field of Fast Starters Coming From Behind In A Brilliant Spurt, Famous Horse Wins By Two Lengths!

Then followed a scene of the horses stomping impatiently at the post A gun was fired, the barrier raised and the race was on A telephoto lens took the race scenes—following the horses around the track "Daisy's Man" 's fast spurt was clearly depicted as the famous horse rounded the three-quarter marker and led the field on the home stretch, finally crossing the barrier These shots were interspersed with normal (one inch) lens shots (of another race) and the subject ended with the presentation of the cup and wreath to the winner (telephoto)

Then follow a number of various shots of the big lumber yard fire of several months ago, a thrilling series of skids on the local auto speedway, and several excellent views of the last parade

As the last scene faded the original "newsreel" title was again flashed on the screen, but this time it was background (double-exposure) by a picture of Mr Filmer cranking a humorous-looking camera made out of an old box The title faded out to be replaced by

THE END

—which faded leaving Mr Filmer still cranking his pseudo

(Continued on Page 126)

Common Sense and Sound-on-Film

by
Henry T. Sharp, A.S.C.

ONE of my friends is going around the world. The other day he came to me and said, "Henry, I've got a great idea! I'm going to get one of these new 16mm sound-on-film cameras and bring back a talkie of my tour!" Then he launched into a lyrical description of the strange sounds and speech he would bring back—of how he'd capture the voices of his shipmates and acquaintances, and record his narrative comments right on the historic spots he filmed. Oh, it sounded beautiful—but it left me as cold as an Eskimo's nose.

You see, I tried it once.

To be strictly truthful, I suppose I'd better admit right off that I didn't do it in 16mm, but in 35mm, with one of the very first portable recorders. The result was Doug Fairbanks' "Around the World in 80 Minutes"—and a lot of grey hairs in the head of Mrs. Sharp's boy Henry. I wasn't particularly proud of either.

So I asked Bill if he felt equal to working as earnestly as a professional cameraman or director whose producer had given him a million dollars and orders to bring back a great picture. You've got to approach talkies from a virtually professional angle if you expect to get results that warrant the extra cost of the equipment—to say nothing of your hopes. You can't go at things in the haphazard, impromptu way you'd make a silent picture; there are too many factors you must have absolutely under control.

First of all, there is the matter of exposure, which always bothers the non-professional filmer. But if you're shooting sound-on-film, you'll have two exposures to worry about—the sound-track as well as the picture. They are side by side on the same film, and they've got to balance up within a reasonable degree. When I made my trip, I used the variable density type of recording, in which the volume at which you record governs the exposure of your sound-track, so I had two variable quantities to match up. Often, I'd strike conditions where I couldn't avoid giving the picture a very light exposure, coupled with loud (and therefore heavily-exposed) sounds. The result wasn't very satisfactory. Luckily, the modern amateur uses the variable area type of recording, in which the sound exposure is pretty nearly uniform for everything. This simplifies matters a good deal, for it reduces your problem to keeping the picture-exposure reasonably uniform. Of course, the methods used in processing the film help out to some extent, but even so, there's still a likelihood that you'll carry over the silent-film fault of most amateurs, and misjudge your picture-exposures even beyond the latitude of the film and processing-control. With silent pictures, this isn't so bad, for there is sometimes still a chance of retrieving valuable scenes by intensifying or reducing, but it's different in sound. Your sound-track is correctly exposed, and (whether you use reversal or negative film) reversed or printed correctly, more or less independent of the picture—so if you intensify or reduce the picture, you'll throw your sound off balance.

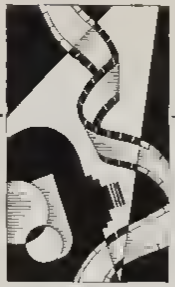
The only answer to that is to expose your picture correctly. Get a reliable exposure-meter and use it religiously on every shot. Don't just use it now and then, but **always!** And before you start out, find out just how much latitude you will have in your picture-exposure with the particular type of film and processing you'll be using. This means tests, and plenty of them. If, like Bill, you're going to be traveling in out-of-the-way places, where you'll encounter out-of-the-way light conditions, you'll do well to make and develop a test whenever you run into anything you aren't sure of. It's simple enough: all you need is a changing-bag and a little bottle of developer. M-Q tubes will do well enough, though the closer you can come to the solution used in the processing plant, the more accurate your test will be. (The Eastman D-9 formula, and two-minute development will give an excellent idea of your relative exposures if you are using reversal film.) For your test, all you need to do is to break off a few inches of film (in the dark, of course—say inside the changing-bag), and slip it into the bottle of developer for the proper time. Then you can bring it out and inspect it. It's a good idea, by the way, to have a few strips of normally exposed and developed negative handy for comparison. After glancing at your test, of course, you can, if necessary, make the scene over again, properly exposed—or go on with the assurance that your shot is O.K.

Next, of course, comes the inevitable question of reversal film vs. negative-positive. The single-perforation film your sound-camera needs is available in both forms; granting that you have your negative developing done in a really good plant, you'll probably do well to use this system, for it will make it easier to edit, and to rectify mistakes in sounding. With reversal, your sound and picture are permanently joined together, but with negative, since the printing of sound and picture are two separate steps, you can eliminate the sound, or replace it with a new track, or even transpose it to another picture. But more about editing later.

(Continued on Page 129)

STANDARDS

Because of the standards set sometime ago the 16mm sound-on-film projector is built to take reversal film. Those desiring to make a negative first and then putting their sound into the film later will have to make a dope of either their sound track or their picture. However, some few sound laboratories are arranging to run their recorder backwards to eliminate this.



TRICKS and GADGETS

● Here's a gadget that many an advanced amateur is going to welcome with open arms It is suggested by Charles and Robert Coles of New York City They call it "An Accurate Frame Counter"

Cinefilmers Coles are photographers of no mean attainment In 1933 they were awarded a medal in the American Cinematographer Amateur Movie Contest, this year they were awarded one of the prizes offered by the manufacturers

The simplicity of this gadget, the fact that everyone can make it and that it can be made for practically any camera is going to give it a wide appeal now that everyone is attempting to secure unusual effects by winding the camera back for fades, lap dissolves, etc

Coles discovered that the key of their camera when laid flat did not revolve, but when left standing at right angles to the camera, the key makes one complete revolution for every three feet of film passing through the gate This was true with their Bell & Howell Filmo What it will be with other cameras will have to be determined by the individual owners You can take a piece of developed film, mark the frame in front of the aperture in the gate, set the key, mark the camera where the key starts, run the camera for one complete revolution of the key and then mark the frame in the gate of the camera in front of the aperture Then count the number of frames that have run through As you know, there are 40 frames to the foot If it doesn't run exactly to the last frame of the foot, you can still make a dial like the Coles counter, but divide it to fit your camera

Here's how Coles made his counter A cardboard dial was made with a hole in the center The circumference of the dial was divided into three equal parts, each sector representing one foot of film Each third was divided into 20 equal parts, each one of these spaces then represented two frames The camera key was removed, the dial put in position and the key replaced

With this device on the cameras which are equipped for winding back the operator is going to shout out several hurrahs for it will permit him to secure smoother lap-dissolves, or if he is making a split stage shot with a mask, he can rewind to the exact frame from which he started

But there is the fellow who cannot wind back Here is the way Coles recommend they operate It will be necessary to make this wind-back scene the first on the roll

When loading the camera, mark the frame of the leader which is behind the aperture with a notch Then close your camera and run the camera to the end of the leader making careful note of the footage Then turn the key backward by hand to the zero position on your new dial It is now ready to count frames accurately

Now when you turn the film back, take it into a dark room Unload and wind the film back by hand so that the leader completely covers the film as it did when you took it from the factory package Reload again in the usual way, placing the notched frame behind the aperture in the gate Then watch your counter closely in running this leader off so that you stop at the same point you stopped before to start your shooting and there you are

Accurate lap-dissolves are easy with this device The film is loaded as described before and the camera run in the usual manner except that the key must rotate When the time for the lap-dissolve arrives the scene is faded out as the key sweeps over one-third of a revolution, and the camera stopped Accurate note of the readings of the footage indicator and frame counter dial is made, the film rewound in a changing bag and reloaded into the camera, again observing the details outlined above The lens is capped and the film run for the exact point where the fade-out was begun and the camera stopped The lens cap is removed, the camera started and the scene faded in as the key sweeps over one third of a revolution Thus the timing will match the previous fade exactly

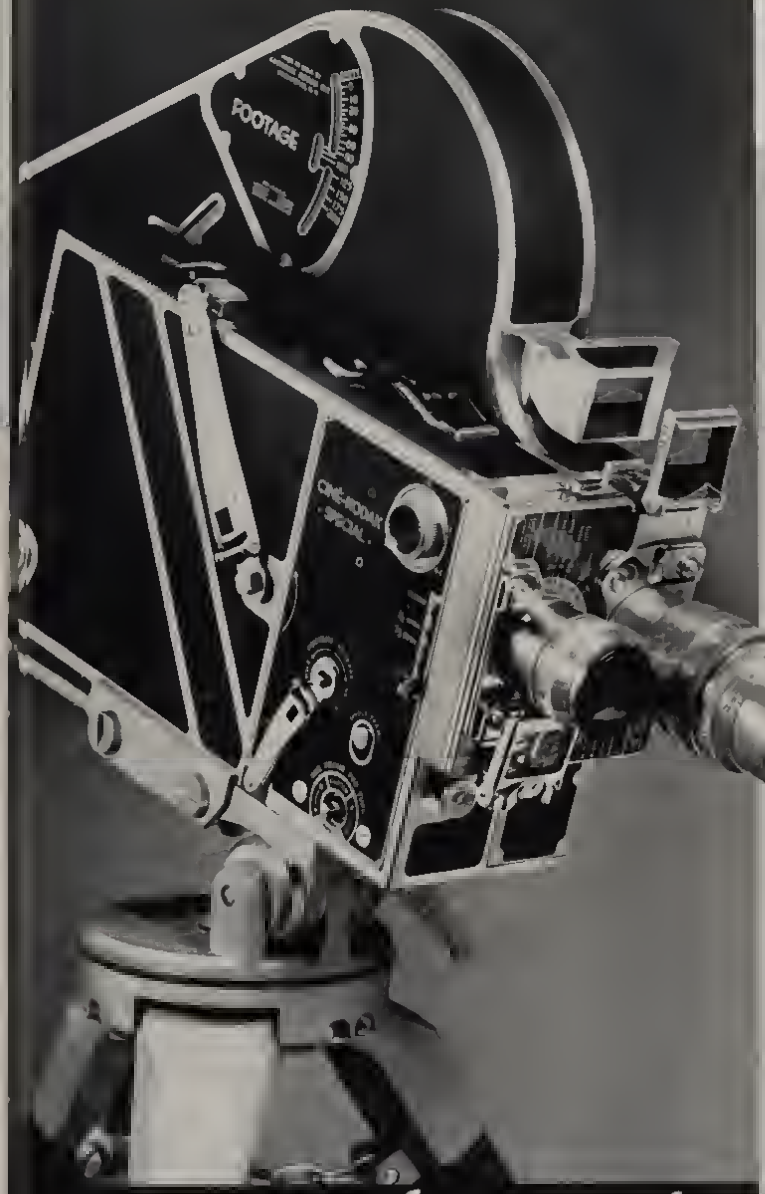
Process Backgrounds

● Several months ago we published an article by Jerry Ash, A S C , on how he made a picture in 16mm with process backgrounds and miniatures For this he employed his projector and a ground-glass screen

He told how he would expose one picture at a time and then take it one at a time with his camera This same method, of course, could be employed in making titles with animated backgrounds Or the ground-glass letters could be posted You could then show one picture from the projector, then photograph that picture and so on until you had enough footage to complete the title If you then wanted this to work right into your picture you could then cut the original film that had been used for the animated background and supplant your title film If your film used for animated background had action in it that action would now synchronize and tie right into your action of the picture by this type of editing

In view of the fact that all of your light is coming from the back your titles would be silhouetted and would therefore show black on the screen, for this reason you should not select dark scenes for this type of title work as the dark scenes would naturally blend right in with your titles and they could not be read

DOMINATES THE FIELD OF 16 MM. MOVIE MAKING



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EFFECTS

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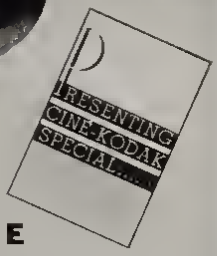

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Like all thorobreds, I have the goods. Precisely made . . . aluminum die cast body . . . phosphor bronze bearings . . . silent gears . . . automatic high speed rewind . . . forward and reverse . . . still pictures . . . and light—plenty of it—my economical long life 400 watt Biplane Mazda is equal to 500 watt results.

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WANTED: More Live Dealers.

...BASS...
CAMERA COMPANY
179 W. Madison St., Chicago

Camera Headquarters for Tourists

FROM SOUP TO NUTS

(Continued from Page 1221)

camera He, too, faded and was replaced by a flash-on title reading

FILMER COMEDIES
presents

to this, in a slow fade in, was added

"LOVE TRIUMPHS".

Then followed 75 feet of an interesting cartoon which was purchased at a local dealer's supply store. At the conclusion of the cartoon another title

"THE END"

is shown, to be replaced by

FILMER MAGIC CARPET
Strange Happenings in Strange
Places by Strange People as They
Pursue Their Daily Habits

The title faded out and the scene faded in with a view of the Metropolitan tower with its gigantic clock (at 12 o'clock noon) This was dissolved into a closeup (telephoto) of the clock face and then faded out The following scene faded in on a small newsboy seated on the curb, holding his papers in one hand and munching a large apple which he held with the other A dissolve brought into view a group of workmen eating lunch in the shade of a building they were wrecking A telephoto lens here let the cameraman get close to the diners without their being conscious of the camera Another quick dissolve disclosed a lunch wagon with its quota of noonday diners entering and leaving (some picking their teeth, which added much to the humor of the scene) Another dissolve brought to view one of the city's finest cafes, with well-to-dos going in and out This dissolved to feeding time at the local zoo and the cameraman, through a series of very quick lap dissolves, showed the table manners of an alligator, a pair of hungry lions and a group of chattering monkeys Another "END" title faded into

JOHN FILMER
PRESENTS

which was quickly dissolved to

Lila Sweet and
Dick Strongheart

then, after a second or two, the word

in

fades in, holds a few seconds more and the whole fades out and the following fades in:

"MANOR MYSTERY"

The main title fades out and the screen is left dark for at least five seconds By this time the audience begins to wonder if you have failed (at last) in your splicing, but their interest is suddenly riveted again when, out of this same darkness, they see the beam of a flashlight — playing around walls and floor, finally coming to rest on a large picture hung on the wall. The light remains stationary at this point while the camera (on a dolly or Junior's wagon) approaches the picture and finally stops at a closeup Into the scene a hand stealthily creeps, grasps the frame of the picture and pulls it back from the wall, revealing a wall safe (cardboard and an old radio dial)

There is no use going into the drama from here, for each of you would have a different plot anyway, but I'm sure you get the idea Good old MELODRAMA in its Nth degree, and there were plenty of laughs in each foot!

One really good scene, however, which provided the end of the plot, was so commendable as to deserve mention here, and was made as follows.

The heroine was in a dimly lit room awaiting the return of her hero (who has gone to investigate a noise in another part of the house) As she watches, a secret panel slowly opens behind her and a long black arm emerges and reaches for her shoulder It closes and she is dragged toward the panel just as the hero returns and fires at the "RAT" The hand relaxes and the "RAT" falls to the floor, dead The hero turns up the lights and the mask and tail are pulled off the villian, disclosing the heroine's step-father, a disgraceful wretch who was trying to steal her money The hero gathers the heroine in his arms as the scene fades into

THE END

The secret panel shot had been made by the clever use of the door on Mrs Filmer's ironing board cabinet, this door happened to be near the real doorway The "RAT" was hidden in the doorway, but when the ironing board door was opened and the hand thrust forward, it gave the desired effect

Immediately after the lost title, was another of a humorous, yet practical nature, carrying out the original idea It read

FILMER THEATER GUESTS
May Park Free in the Hollywood Boulevard Parking
Area

This was backgrounded with a scene of the street in front of the house and always gets a big laugh from the audience It was followed by a SCROLL TITLE which read

PREVIEWS—

Coming to this Theater in the near future (we hope) more films of this same type We hope you have enjoyed yourselves

And now, if you will be kind enough to assemble in the other room you will find a buffet lunch is being served

THAT'S ALL—THANK YOU!

Well, there it is! A lot to cram into four hundred feet of film you'll admit, but the necessity for brevity of each scene makes for its success to a great measure One has no chance to be bored, for the subjects are constantly changing and the humor of the whole reel is apparent—even in reading this You will want to use your own subjects, of course, but this outline can start you in the right direction toward making a real reel "FROM SOUP TO NUTS" Good luck to you filmers!

Dufay Leica Colorfilm for Miniature Cameras

(Continued from Page 119)

Morgan and Orville Krehbiel, of The Morgan Camera Shop in Hollywood for the cooperation they gave me during our experiments with Dufaycolor film and for their work in processing the many rolls of film used for these experiments

The regular Reela or Carrex developing tanks may be used for the processing of the color film During the reversal stage the film is unwound from the reel and exposed to light and then carefully rewound on the reel for the balance of the processing A more convenient method of developing would be to use the glass developing drum outfit The film can be placed on this drum and left there through the entire process

The processing formulae used for Dufay Leica Colorfilm (DuPont emulsion) is as follows

1. First Development

Water up to (at 125°F)	2000 cc
Metol	13 grams
Hydroquinone	4 grams
Sodium Sulphite, dry	100 grams
Potassium Bromide	5½ grams
Ammonia, spec grav 0 91	33 cc

Dissolve the above chemicals in the order named, cool to 65°F and add ammonia (if ammonia of stronger specific gravity only is available either dilute same or use proportionately less, according to its strength)

Development time in the above bath with correctly exposed subjects, 2½ to 3 minutes at 65°F

2. Wash—One minute

3. Bleaching Bath (Reversing)

Potassium Permanganate	3 grams
Sulphuric Acid	10 cc
Water	1000 cc

Bleach until image is clearly visible, time about 4 minutes

4. Wash for about 2 minutes in running water.

5. Rinse for about 2 minutes in following clearing bath.

Clearing Bath — 2½% solution of Sodium Bisulphite

Water	1000 cc
Sodium Bisulphite	25 grams

6. Rinse after clearing.

7. Expose film to strong artificial light (100-watt bulb) for about a minute or until the film begins to turn slightly pinkish Then the film is redeveloped in any good metol-hydroquinone bath The following may be used

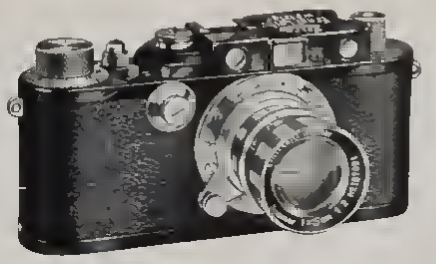
Water up to (at 125°F)	4000 cc
Metol	4 grams
Sodium Sulphite, dry	200 grams
Hydroquinone	18 grams
Sodium Carbonate, dry	75 grams
Potassium Bromide	4 grams

Time of final development, 3 to 4 minutes at 65°F

8. Rinse

The film is now fixed and hardened, given a final washing, and then dried

This processed Dufaycolor strip is now ready for projection Fortunately for this process, there are several excellent projectors for Leica pictures already available It is a curious fact, that lower screen brilliancy is more acceptable for color than for black and white So even



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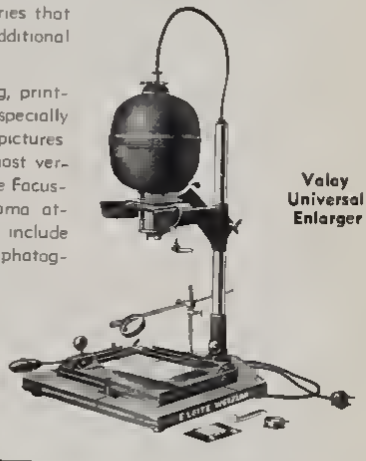

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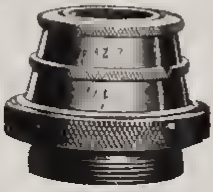
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the small Umena projector (100-watt) is excellent for projecting nice size images in color. The color film pictures should be cut apart and bound between 2"x2" cover glasses. In this way the films are very convenient to handle and to project.

Dufay Leica Colorfilm may be used for magazine illustrations. In fact it is being done in England at the present time. Recently, there appeared in a British publication some candid pictures made of King George. They were reproduced in full color and were almost 8 by 10 inches in size.

It is expected that within the near future, on economical means of providing color prints from Dufaycolor film, will be offered to users of this color film. This will certainly fulfill a long desired wish.

The future of color photography looks very bright, indeed. The rapidly increasing use of color photographs in advertisements and for magazine illustrations, indicates that the public is becoming increasingly color conscious. The impetus that color photography will receive, now that Dufay Leica Colorfilm and the miniature camera make photography possible in colors in many interesting fields that once were limited to black and white, will be all that is needed to make it exceedingly popular. So, make way for the candid color photograph!

Tips on Home Projection

(Continued from Page 117)

possible to project pictures around a corner. To "step up" the image, place the mirror equidistant from projector and screen and the size will be doubled.

Never throw away the black, unexposed strips of film which are cut out and set aside while editing. Splice 2-foot leaders and trailers into your reels to prevent unnecessary white glare on the screen after the reel has been projected.

Using red or black crayon, print the title of every 400-foot reel on the cover of each humidor can to identify the subject. Because crayon lettering is hard-wearing yet easily removed, this has an advantage over waterproof ink or enamel paint.

Lastly, here is a helpful "kink" which makes cleaning films a pleasure. Sew a 2-inch square of flannel or other soft, lintless cloth on the thumb and forefinger of an old left-handed glove. Moisten each pad with film cleaning solution and allow the film to pass lightly between these squares while the right hand turns the takeup reel. In this way, films can be cleaned quickly and efficiently. They will always be sparkling and clear.

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COMMONSENSE AND SOUND-ON-FILM

(Continued from Page 123)

All these technical details about exposure, film, tests, and so on sound pretty formidable, don't they? But you ain't heard nothin' yet! You haven't even gotten to making your scene. Remember when you were a little boy, and had to "speak a piece" in school, how scared you got—how you gulped and gurgled, while every recollection of the piece fled from your mind? Well, nine people out of ten get just as scared when they get in front of a microphone. John Citizen and his wife are pretty silly specimens when they get in front of a silent-picture camera—and they're likely to be a hundred times worse trying to improvise words in front of a sound-camera. This means that you'll have to prepare everything you shoot in sound, work out a script, with dialog, and rehearse your people until they "do their stuff" pretty near perfectly. And even then, the chances are ten to one that they'll get mike-fright when you actually shoot the scene!

So you'll simply have to "stage" every bit of talkie action—even the ones you want to seem most spontaneous and impromptu. When we were making "Around the World in 80 Minutes," we learned this lesson from sad experience. Doug has been acting on the stage and screen for more than twenty-five years, but even he found he wasn't so hot "ad-libbing" in front of a sound-camera. As a result, we "staged" nearly all of our sound scenes as carefully as though we were working in a studio. The really impromptu shots, you'll remember, were shot silent (with our Eyemos), and the sound was added later.

The same is just as true of those scenes where you supply a Graham McNamee-esque narrative. If anything, it's rather more so, for it's mighty near impossible to concentrate properly on your camerawork and spout bright discourse at the same time — especially if the bright discourse is being recorded, and you know it. Will Rogers might do it, or Bill Fields—at least the talking part—but you and I would find it an impossible assignment.

Then, there's another thing. Shooting silent pictures, if you muff a scene, you can usually shoot it over again, and snip the bad one out of your film afterwards. But cutting sound-on-film isn't so easy! In the studios, we record our sound on a separate film, and only join it with the picture in the finished print. But in amateur sound-on-film, which is what we call "single-system" sound, the sound and picture are on the same strip of film: the sound for any given frame is twenty-five frames ahead of the picture, so if you cut for the picture, you're likely to trim out a lot of commas, periods, and semicolons you really want to keep in the sound-track—while if you cut for the sound (which is difficult), your picture isn't likely to be well-cut. There are mighty few professional film-editors who care to cut single-system film.

So far, you see, I've managed to punch a lot of holes in friend Bill's great plan. But it's a pretty poor critic who only tears things down: isn't there some idea that would help him get his sound-films more easily? Well, here is what I advised him to do. First of all, I suggested that he keep his present camera, and film his trip silent. Then when he came home, he could get a sound-camera and, using it strictly as a recorder, make up a really good sound-track of dialog, narrative and music, which could very easily be fitted to his already-edited silent picture. If the picture had been shot on negative, the job would be simple, if it had been done on reversal, a duplicate negative would have to be made. In any event, the laboratories don't charge any more for

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sound-printing if sound and pictures are on two separate negatives, or one

Secondly—and I think Bill will do this, for he has his heart set on getting a sound-camera—he could use the outfit, shooting whatever he could in sound, and the rest silent (by simply removing the batteries that power the sound-equipment), and making most of his sound-track later, as in my first suggestion This, of course, would give him a chance to try recording the actual noises of his alluring lands, and making dialog-scenes of his friends In this, I know he's going to learn a lot about microphone - placing There is really quite a trick to getting a mike where it will give you a good record, and yet be either out of the picture, or unnoticed Recording in the open, by the way you can often hide the mike behind some bushes, or the like, right in the picture, yet give no suggestion that the thing is there And, for good recording, you'll have to have the mike close to the people—about a yard (or less) from their mouths, as a rule This, incidentally, suggests another reason why it is a good idea to make as much of your sound as is possible separately

About at this point, Bill asked me how I expected him to record music for his sound-track I reminded him that he has a phonograph—and it is quite easy to play any record he chooses to use in his score, with the microphone close to the phonograph's loudspeaker The fact that the motor of a 16mm sound-camera will only run about 25 feet of film at a winding complicates this somewhat, but even so, it can be done Here's another point to look out for phonograph records aren't by any means all recorded at the same volume-level, so you'll have to be mighty careful to balance this up, or your accompaniment will be faint for a few scenes, and then suddenly blast forth like thunder

Summing the whole matter up, if you're going to try sound-on-film pictures, you'll find that you have to prepare everything as carefully as though you were Cecil DeMille making a gigantic spectacle You'll have to have the patience of Job in directing your actors You'll have to have your technique — especially exposure — letter-perfect You'll have to cut your picture with your camera And most of all, you'll have to work like a horse! If this isn't too high a price to pay for the thrill of making your own sound-films, go to it· you'll have a big job on your hands—but you'll get pictures that won't need any apologies

*Eastman D-9 developer.

Stock Solution A

Water (about 125°F)	16 oz
Sodium Bisulphite	¾ oz
Hydroquinone	¾ oz
Potassium Bromide	¾ oz
Cold water to make	32 oz

Stock Solution B

Cold water	32 oz
Sodium Hydroxide (Caustic Soda)	1¾ oz

Use equal parts of A and B, and develop 2 to 2½ minutes at 68°F Reversal film has a non-halation backing which can be removed by wiping with methyl alcohol

The two Stock Solutions keep well separately, but when mixed deteriorate very rapidly Cold water should always be used when preparing Solution B, as considerable heat is evolved When mixing the two solutions, Solution A should be stirred thoroughly to prevent precipitation of the caustic

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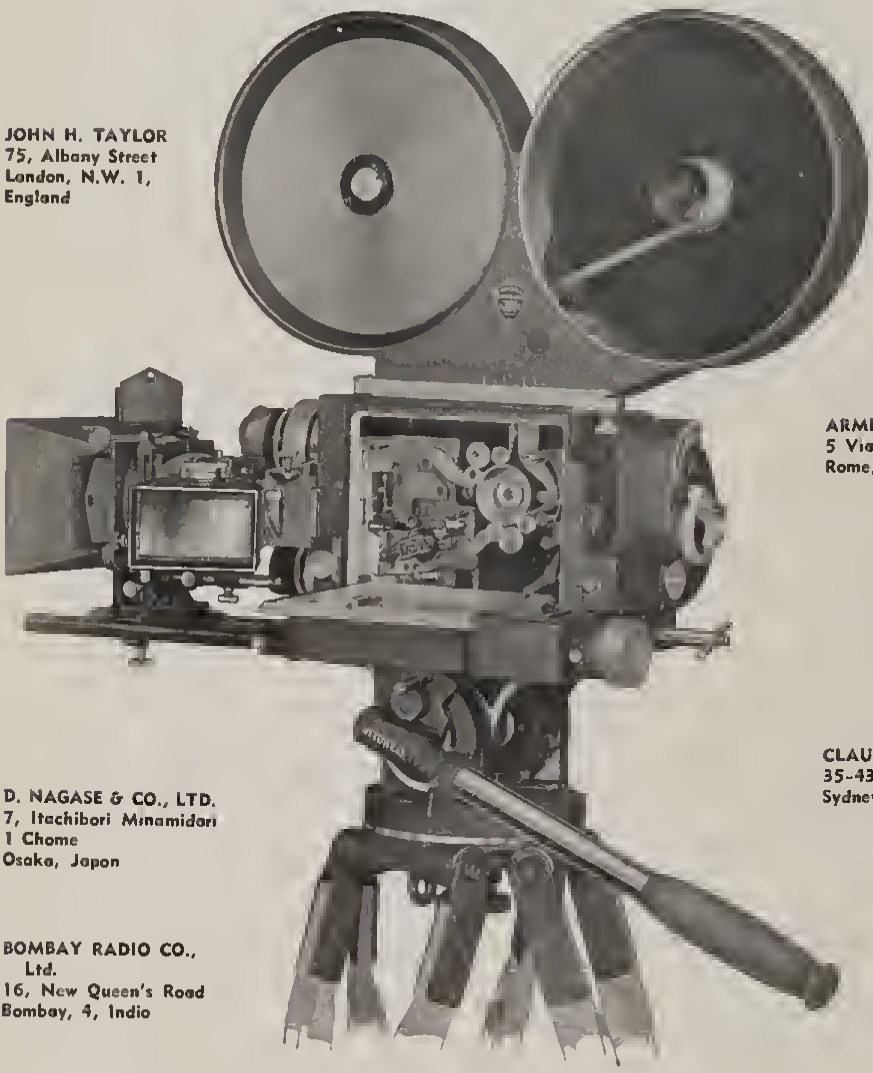

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